# HELMINTHOLOGICAL ABSTRACTS

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## 37—American Journal of Diseases of Children.

*a.* TSUCHIYA, H. & ROHLFING, E. H.—" Hymenolepis nana : report of additional cases and an experimental transmission from man to rats." XLIII (4), 865-872, 23 refs. [April, 1932.]

(a) In two cases of *Hymenolepis nana* encountered by Tsuchiya and Rohlfing in St. Louis, U.S.A., there were no indications of any associated pathological condition either in the laboratory examinations or in the clinical symptoms.

In spite of large numbers of ova in the stools, there was no diarrhœa, anæmia or abdominal pain. Nutritional and nervous disturbances were absent and there was no eosinophilia. Cross infections from man to rat resulted in the successful infection of 2 out of 6 clean rats and subsequently 5 out of 10 clean rats were infected originally from human material.

R.T.L

## 38—American Journal of Hygiene.

*a.* EARLE, W. C. & DOERING, C. R.—" An evaluation of egg-count data in hookworm infestation." XV (2), 513-556, 6 figs., 22 tables, 22 refs. [March, 1932.]

*b.* DOVE, W. E.—" Further studies on *Ancylostoma braziliense* and the etiology of creeping eruption." XV (3), 664-711, 8 figs., 7 tables, 45 refs. [May, 1932.]

*c.* GRAHAM, G. L., ACKERT, J. E. & JONES, R. W.—" Studies on an acquired resistance of chickens to the nematode *Ascaridia lineata* (Schneider)." XV (3), 726-740, 1 table, 27 refs. [May, 1932.]

(a) Earle and Doering point out that all previous statistical work on hookworm data has taken for granted the " normal " frequency distribution of egg and worm counts. Their distributions are in fact markedly skew, whereas logarithms of counts give approximately normal distributions.

Applying this technique the authors reveal : (i) high correlation between eggs and worms, (ii) concentration of eggs in small stools, (iii) diminution of eggs per worm with high worm densities, and (iv) more eggs per worm in *Ancylostoma* than in *Necator*. There remain difficulties in estimating eggs per gramme per worm, and injury as measured by hæmoglobin reduction.

B.G.P.

(b) Present knowledge of the " creeping " eruptions is reviewed by Dove and new facts are contributed to their etiology. Creeping eruption may be caused by fly larvæ, *Gastrophilus* and *Hypoderma*; by ants and mites and by nematodes of the genera *Gnathostoma*, *Uncinaria* and *Ancylostoma*.

Experimental attempts to cross breed *A. braziliense* and *A. caninum* were unsuccessful. The variations found in the buccal capsule of a pure line strain of *A. braziliense* are comparable with the variations in this species reported from different localities. The identity of *A. braziliense* in the cat in Florida and in the dog in Texas was established by interbreeding experiments. The lesions of creeping eruption are not produced experimentally in the dog, cat, rat, guinea pig or monkey. A much lower percentage of infection occurs through the skin than by the mouth in the cat and dog. From oral infection the average in the cat was 26.03 per cent., in the dog 42.96 per cent. and from skin infection 14.22 per cent. and 13.57 per cent. respectively. Experiments proved that thermotropism is a more important factor than histotropism in the penetrations of *A. braziliense* larvæ. Temperatures sufficient to cause visible perspiration on the skin were favourable to skin penetration by larvæ but in lower temperatures, when sensible perspiration did not occur, the larvæ of *A. braziliense* from cats and dogs did not penetrate the skin of man. Under similar conditions the infective larvæ of *A. caninum* are capable of producing a dermatitis of the human skin. An incidental intestinal infection of *A. caninum* is reported from a boy in Texas. R.T.L.

(c) Graham and his collaborators produce evidence to show that the chicken can acquire a resistance to the intestinal nematode *Ascaridia lineata*.

In the initial group of experiments, 84 chicks were parasitized at the age of 5 weeks and again at 10 weeks. The numbers and lengths of worms obtained from the later feedings indicate that a slight degree of immunity had been established in the group which had an earlier infestation.

In the second group of experiments a similar procedure was adopted except that the birds were given carbon tetrachloride to eliminate the primary infestation before the second feeding of eggs was made. The controls were similarly treated. At autopsy the numbers and lengths of worms present was measured and there was some evidence here also that a previous infestation produces a slight immunity. Only in one case, however, were the differences in number and length of the worms in the two groups statistically sound.

Carbon tetrachloride injures the liver causing the ionized blood calcium to unite with the bile. This in some way retards the rate of growth of the young worms but if extra calcium is supplied no retardation of growth occurs. They suggest further that the immunity is brought about by the formation of antibodies. The young Ascaridia burrow into the mucosa of the intestine and in this way come into close contact with the tissues which are then stimulated to antibody production. P.A.C.

## 39—Annales de Parasitologie Humaine et Comparée.

*a*. TSENG, SHEN.—" Étude sur les cestodes d'oiseaux de Chine." x (2), 105-128, 20 figs., 12 refs. [March, 1932.]

*b*. MEHRA, H. R.—" Nouveaux monostomes de la famille des *Pronocephalidæ* des tortues d'eau douce de l'Inde, classification de cette famille." x (3), 223-247, 6 figs., 7 refs. [May, 1932.]

*c*. LOPEZ-NEYRA, C. R.—" *Hymenolepis pittalugai* n. sp. et ses rapports avec les espèces similaires (*H. macracanthos*)." x (3), 248-256, 11 figs., 4 refs. [May, 1932.]

*d*. MICHAJLOW, W.—" *Triænophorus crassus* Forel (*T. robustus* Olsson) et son développement." x (3), 257-270, 3 figs., 13 refs. [May, 1932.]

*e*. PENSO, G.—" Présence des œufs d'oxyures en pleine muqueuse intestinale et biologie des oxyures." x (3), 271-275, 1 pl., 6 refs. [May, 1932.]

(a) Tseng has described several cestodes, from Chinese birds of the Order *Anseres*, collected by E. C. Faust.

The birds belong to the genera *Anas*, *Nyroca*, *Anser*, *Dafila*, *Querquedula*, *Clangula*, *Casarca*, *Mergus*, *Fuligula*, *Spatula*, and *Aex*, and the cestodes to the genera *Digramma*, *Raillietina*, *Hymenolepis*, *Weinlandia*, *Fuhrmanniella*, *Diorchis*, *Fimbriaria*, *Diploposthe* and *Anomotænia*. The following new species are described and figured: *Hymenolepis longistylosa* and *H. pingi* from *Anser segetum*, *H. meggitti* from *Anas sp.*, *Weinlandia mayhewi* from *Clangula glaucion*, and *Fuhrmanniella fausti* from *Anas boschas*.

B.G.P.

(b) Mehra here describes three new monostomes, of the family *Pronocephalidæ*, from Indian fresh-water turtles, and classifies the family giving a key to the genera.

The new forms are *Diaschistorchis gastricus* n. sp. from the stomach of *Kachuga dhongoka*, *K. smithii*, *K. tectum* and *Hardella thurgi*; *Neopronocephalus triangularis* n.g., n .sp. and *N. gangeticus* n. sp. both from the small intestine of *Kachuga dhongoka*.

Mehra states that the genera *Wilderia* Pratt, 1914 and *Synechorchis* Barker, 1922 should fall into the synonymy of *Diaschistorchis* Johnston, 1913, for which genus he gives a revised and completed diagnosis. He clarifies the *Pronocephalidæ* by erecting three new sub-families: *PRONOCEPHALINÆ* (two testes behind the ovary) containing the genera *Pronocephalus*, *Cricocephalus*, *Epibathra*, *Adenogaster*, *Glyphicephalus*, *Pleurogonimus* and *Macravestibulum*; *NEOPRONOCEPHALINÆ* (two testes in front of the ovary) containing only *Neopronocephalus*; and *CHARAXICEPHALINÆ* (testes numerous) containing *Charaxicephalus*, *Diaschistorchis* and *Desmogonius*.

B.G.P.

(c) Lopez-Neyra describes a new cestode, *Hymenolepis pittalugai* n. sp. from *Anas platirhynchos*, and discusses the identity of *H. macracanthos* von Linstow, 1877, from *Clangula clangula*.

In 1924 Fuhrmann discovered a cestode from *Mergus serrator* which he assigned to this species: the author considers it to be a distinct species and proposes the name *H. macracanthoides*. Similarly, a parasite

discovered by Linton in 1927 from the same bird and referred by him to von Linstow's species is considered by Lopez-Neyra to be a third species, which he names *H. lintoni* [These two new names appear as emendations by " Lopez-Neyra 1931 " in the author's summary : there is no mention of their publication before 1932]. B.G.P.

(d) Michajlow has examined the adults and larval stages (up to the procercoid) of *Triænophorus crassus* Forel, a cestode parasitic in the pike. The hooks on the adult head are figured and a suitable mensuration formula is devised by means of which the author's material is compared with that of Schewring. The egg, onchosphere and procercoid, including the larval hooks, are described and compared with corresponding stages of *T. nodulosus*. By staining living specimens with methylene blue or neutral red, or mounted preparations with methyl green—pyronin, it is possible to distinguish certain " germinative cells " in egg, onchosphere and procercoid. In the onchosphere there is usually an even and characteristic number of these cells. Thus in *T. crassus* the author has found 10 cells in 54 per cent. of onchospheres examined and 8 cells in 34 per cent., and in *T. nodulosus* 14 cells in 52 per cent., 12 in 13 and 16 in 12 per cent. *Cyclops strenuus* was easily infected, and *Diaptomus gracilis* with difficulty, with onchospheres of *T. crassus*. In the resulting procercoid the germinative cells increase in number. They may constitute the rudiment of the future reproductive organs. B.G.P.

(e) Penso figures and discusses the presence of oxyurid eggs wholly within the intestinal mucosa, and puts forward a new theory of the life-cycle.

*Oxyuris ambigua* in the hare has been found by the author to lay its eggs under the mucosa. *O. vermicularis* has several times been recorded from the appendicular wall in human cases of appendicitis, and two cases are referred to in which the worm had perforated the intestinal wall and penetrated into the peritoneum. Penetration of the mucosa for purposes of egg-laying may therefore be assumed to be not unusual.

The author concludes that auto-infestation is not sufficient to explain the tenacity and duration of oxyuriasis, and that the worms can multiply without at any time leaving the body of the host. On this view the adult phase and the period of coitus occur in the lumen of the intestine, the egg-laying and larval phase in the intestinal wall. The anal migrations of gravid females are to be explained as ensuring the diffusion of the parasite from individual to individual. B.G.P.

## 40—Annales de la Société Belge de Médecine Tropicale.

*a*. ARNAUD, R.—" Rapport de mission sur l'ankylostomiase dans le secteur du laboratoire de Léopoldville." XII (1), 5-34. [March, 1932.]

*b*. COLOMBO.—" Les parasitoses intestinales parmi les enfants des écoles indigènes du district du Tanganyka-Mœro." XII (1), 35-50. [March, 1932.]

*c*. MATTLET, G.—" Note sur le parasitisme intestinal au Ruanda-Urundi." XII (1), 51-57. [March, 1932.]

*d*. PERCHER, J.—" L'épidémiologie des helminthiases chez les indigènes au Mayumbe (Congo belge)." XII (1), 59-100, 16 figs., 66 refs. [March, 1932.]

(a) Arnaud has surveyed the country surrounding the urban district of Leopoldville for ankylostomes and other helminths, using a modified Stoll technique, and has demonstrated hæmorrhagic effects in cases of heavy ankylostome infection. Complement fixation and cutaneous reactions were also tested.

From 2,653 fæcal examinations it is shown that 71.7 per cent. contained ankylostome eggs, alone or with ascaris, trichocephalus or strongyloides. Only 20.8 per cent. were negative for all helminths. The ankylostomes were 92.8 per cent. *Necator americanus* and the rest *Ancylostoma duodenale*. For detecting blood in fæces a freshly prepared alcoholic solution of pyramidon was used (Thévenon and Rolland reaction); no blood was detected in parasitically negative fæces, in fæces demonstrating helminths other than hookworm, or in hookworm fæces of less than 1,800 eggs per gramme. It was detected always in hookworm fæces of more than 3,000 eggs per gramme, but the amount (estimated from the degree of colour reaction) bore no direct relation to number of parasites. The hæmoglobin index was low (65 per cent.) for both negatives and positives and bore no relation to the degree of infestation. Complement fixation with alcohol-acetone extract was usually positive with known carriers but the cutaneous reaction gave anomalous results, including 16 negatives in known carriers. Ankylostomiasis is very extensive among Congo natives but of these the great majority are "healthy carriers." B.G.P.

(b) Colombo shows that, of 1,505 native children in Catholic schools in the Tanganyka-Moero district, 51.4 per cent. had intestinal parasitoses, 13.8 per cent. multiple infections.

An editorial note points out that, since the examinations were made with fresh fæcal smears, unconcentrated, the data are minima. Of the simple infections 78.4 per cent. were due to nematodes (mostly hookworm), 17.3 per cent. to schistosomes, 0.5 per cent. to cestodes and 3·8 per cent. to protozoa (amœbæ). The data are fully tabulated under sex, age, locality, etc. B.G.P.

(c) Mattlet states that yaws, malaria and intestinal parasitoses are the principal diseases of Ruand-Urundi. Unlike Rhodesia and the Congo, this area is characterized by relatively few hookworm cases (19.1 per cent., based on 1,519 fæcal examinations) and by many ascaris (53 per cent.) and trichuris (23.8 per cent.) cases.

*Strongyloides*, *Oxyuris* and *Schistosoma mansoni* are infrequent (less than 6 per cent. each). *Tænia* is present far more commonly than the fæcal examinations indicate (10.8 per cent.): it is always to be found at autopsy, and the true infection is nearer 100 per cent. *Echinococcus* has not been observed in man during a practice of 10 years, though it is common in animals, and dogs abound.

The relative distribution of helminths is due to the cool climate (the district is a mountainous plateau of 1,400-2,000 metres), which favours only resistant eggs, and to the habits of the natives, who use no water but

annoint their bodies with butter to which helminth eggs and amœbic cysts easily adhere. The helminthiases are of pathological importance principally as complicating other affections. B.G.P.

(d) Percher presents a study of the epidemiology of verminoses, especially ankylostomiasis, in a geographically isolated zone between the Lubugi and Lukula rivers in Belgian Mayumbe.

At least one member of each family was examined in every village, in all 1,156 persons from the northern mountainous area and 1,116 from the western plain. The Stoll technique was employed. Ankylostomes were found in 90.1 per cent. of the mountainous population and 96.7 per cent. of that of the plain: in the latter the infection per individual was considerably more intense, a condition reversed in the case of trichuris. Ankylostomes were more numerous in males than in females: ascaris and trichuris showed the reverse relation. This differentiation according to sex appears at about the age of 5 or 6. Statistics are presented, in graphical form, showing the distribution of hookworm, trichuris and ascaris according to age, sex and locality. B.G.P.

## 41—Annals of Tropical Medicine and Parasitology.

*a.* MOHAMMED, A. S.—"The secretory glands of the Cercariæ of *S. hæmatobium* and *S. Mansoni* from Egypt." XXVI (1), 7-22, 7 figs., 14 refs. [March, 1932.]

*b.* GORDON, R. M.—"The molluscan host of *S. hæmatobium* in Northern Nigeria." XXVI (1), 117-118, 1 fig., 1 ref. [March, 1932.]

(a) Mohammed affirms that the cercariæ, presumably of *Schistosoma hæmatobium*, obtained from naturally infected *Bulinus* in Egypt have five pairs of secretory glands of which the two anterior pairs are oxyphilic. and the three posterior pairs basophilic. The cercariæ, of *Schistosoma mansoni*, taken from *Planorbis boissyi* collected in Egypt, have six pairs of secretory glands, viz., two large anteriorly-placed acidophilic and four small pairs of basophilic glands situated posteriorly.

These results agree as regards *S. hæmatobium* with the findings of Blacklock and Thompson and as regards *S. mansoni* with the conclusions of Faust.

R.T.L.

(b) At Kano in Northern Nigeria, where a high proportion of the children suffer from urinary bilharziosis, Gordon finds that the numerous small ponds within the city walls are infested with *Physopsis globosa*, a proved carrier of *S. hæmatobium* in Sierra Leone.

R.T.L.

## 42—Archiv für Schiffs- und Tropen-hygiene.

*a.* VOGEL, H.—"Beiträge zur Epidemiologie der Schistosomiasis in Liberia und Französisch-Guinea." XXXVI (3), 108-135, 12 figs., 42 refs. [March, 1932.]

*b.* HAUER, A.—"Kasuistischer Beitrag zur Symptomatik und zum Blutbild der Loainfektion." XXXVI (4), 181-185. [April, 1932.]

(a) Vogel reports upon such epidemiological factors as climate, local customs and distribution of vectors which influence the spread of schistosomiasis in Liberia and French Guinea. *S. hæmatobium* is common in the hinterland of Liberia and gives rise to serious vesical and genital disease. *S. mansoni* is very localized, being common in the Cercle de Gueckédon (French Guinea).

The author was unable to trace the intermediate host of *S. hæmatobium* in Liberia, but thinks it is probably *Physopsis globosa*, as in the adjoining Sierra Leone. Monkeys infected with cercariæ from *Planorbis pfeifferi* passed *S. mansoni* eggs in 40 days and this snail was readily infected with miracidia, so that it is probably the usual intermediate host for *S. mansoni*. These and other snails are illustrated as is also the cercaria of *S. mansoni* which is described in detail. The universal infection with *S. mansoni* in a native village where there was but little opportunity of infestation was fully investigated and is explained by unhygienic local customs. In view of the localized distribution of *S. mansoni* control measures promise to be effective. B.G.P.

(b) Hauer describes two cases which, from the clinical syndrome, were obviously cases of *Filaria loa* infection yet which had revealed no microfilariæ at the time of writing.

In one case only were calabar swellings present and in this case asthmatic tendencies developed also. Eosinophilia (over 70 per cent.) and the associated leucocytosis (over 23,000) were present in both cases, and were not ascribable to other helminths. B.G.P.

## 43—Archives Medicales Belges.

*a*. DURAND, G.—" Oxyures. Diagnostic et traitement chez l'adulte." LXXXV (3), 153-154. [March, 1932.]

(a) This note contains nothing original but usefully summarises an article by W. P. MacArthur. R.T.L.

## 44—Australian Veterinary Journal.

*a*. GORDON, H. McL.—" Some helminth parasites reported from Australia for the first time, with a description of *Cooperia McMasteri*, sp. Nov., from a Calf." VIII (1), 2-12, 6 figs., 22 refs. [March, 1932.]

*b*. KAUZAL, G.—" Note on the treatment of Lung Worm, *Dictyocaulus filaria* (Rud., 1809), Infestation of Sheep." VIII (1), 25-28, 4 refs. [March, 1932.]

*c*. KAUZAL, G.—" The use of carbon tetrachloride in the treatment of kidney worm infestation in the pig." VIII (2), 68-69, 1 ref. [April, 1932.]

(a) Gordon records nine species of helminths from domestic mammals in Australia and includes a check list of the Strongyles of sheep and cattle in the Commonwealth.

The species now recorded are *Helicometra giardi*, *Toxascaris leonina*, *Monodontus trigonocephalus*, *Ostertagia trifurcata*, *Cooperia punctata*, *C. oncophora*, *C. McMasteri*, *Trichostrongylus rugatus* and *T. vitrinus*. *C. McMasteri* occurs in the small intestine and resembles *C. oncophora* and *C. bisonis*. T.W.M.C.

(b) Kauzal infected a number of sheep with *Dictyocaulus* and treated them with Carbon tetrachloride, tetrachlorethylene and a mixture of chloroform, creosote, ol. terebinthinæ and olive oil.

A single treatment consisting of intratracheal injections of the various remedies or insufflation of the first two, did not remove all the worms in any case, but the numbers treated were too small to allow any useful estimate of the relative value to be obtained. Intratracheal injections with carbon tetrachloride were dangerous, but insufflation produced no obvious ill effects. T.W.M.C.

(c) Kauzal has tried the effects of Carbon tetrachloride on the young stages of *Stephanurus dentatus* in the liver of Pigs.

From the results obtained in 5 cases the drug appears to have a selective action, and may prove a valuable adjunct to other control measures as *Stephanurus dentatus* spends at least four or five months in the liver. R.T.L.

## 45—Berliner Tierärztliche Wochenschrift.

*a*. SPREHN, C.—"Ueber Krankheiten der ersten Lebensmonate bei den Pelztieren auf Grund eigener Erfahrungen." XLVIII (13), 193-196. [25th March, 1932.]

*b*. GIESE, C.—"Gesundheitschädigungen von Menschen und Tieren nach Genuss von Milch von Kühen, die mit den Leberegelmitteln Neoserapis und Distol comb. behandelt worden waren." XLVIII (16), 241-243. [15th April, 1932.]

*c*. MIDDELDORF.—"Die Lungenwurmkrankheit der Rinder und ihre Behandlung mit G.H.25." XLVIII (20), 312. [13th May, 1932.]

*d*. SCHMID, F.—"Die neueren Ergebnisse in der Erforschung der Lungenwurmkrankheit und ihre Bedeutung für die Bekämpfung." XLVIII (22), 352-355, 27 refs. [27th May, 1932.]

(a) In the course of a lecture, Sprehn states that in his experience the important diseases of fur-bearing animals in the first months of life are mainly helminthic.

In foxes, *Toxocara canis*, *Uncinaria stenocephala*, *Crenosoma vulpis* and *Eucoleus aerophilus* are the chief parasites. *T. canis* exerts a toxic action, especially after the death of the worms: anthelmintics must therefore be used with care; it also, as a larva, frequently invades the fœtus in utero. Even with wire-floored pens this ascarid, and the lungworm *E. ærophilus*, develop readily in the breeding boxes. The hookworm, which appears to cause fatty degeneration of the liver, requires moist earth for its larval development, however, and the other lungworm probably develops in an intermediate host. In mink which are kept in wire-floored enclosures, the worst parasites are Coccidia and *Capillaria entomelas*. With open

runs, *Molineus* spp., *Strongyloides papillosus*, *Troglotrema acutum* and *Euryhelmis squamula* (the two latter transmitted by frogs) may be important. Raccoons suffer chiefly from ascariasis (*T. canis* and others) and epilepsy. The parasitic diseases of the musk-rat are not well understood but, in addition to coccidia, *Strongyloides* and a trichostrongyle are important, and *Fasciola hepatica* (readily acquired from truly aquatic snails) may become a serious pest. B.G.P.

(b) Giese discusses the effect on milk of liver-fluke drugs given to cattle. The milk has a peculiar odour and taste and may have slight ill effects on persons who consume it, especially on children.

Carbon tetrachloride is dangerous to cattle, and the other fluke remedies (hexachlorethane, tetrachlorethylene, benzol extract of male fern) all affect the milk: this applies to "Distol comb." and "Neoserapis" both of which contain one or more of these hydrocarbons. The Public Health Department prohibits the consumption of milk from cows within 5 days after treatment. B.G.P.

(c) Middeldorf concludes from the treatment of 86 cases that "G.H. 25" is the best drug for lungworms in cattle. The drug, manufactured by the Gesellschaft für Seuchenbekämpfung A.-G., Frankfurt-a-M., contains principally menthol, thymol, turpentine and phenol and is injected intratracheally in one or two doses of 15-25 cc. for 6-months old calves and 35-50 cc. for 1 or 2 years old cattle. It is a vermicide and expectorant without harmful action. B.G.P.

(d) Schmid reviews recently acquired knowledge of the life-history and therapeutic control of lungworms in domesticated animals.

In the Dictyocaulus-group the development is direct, but in the Synthetocaulus-group (*Muellerius* and *Protostrongylus*) and the Metastrongylus-group there is indirect development, in snails and slugs on the one hand and in earthworms on the other. The recent work on these three groups is discussed in detail, as is also the diagnosis of lungworms from larvæ in freshly passed fæces. Recent work on treatment, consisting mainly in the intratracheal injection of vermicidal substances, is discussed in detail.

B.G.P.

## 46—Biologisches Zentralblatt.

*a.* SINITSIN, D. F.—"Studien über die Phylogenie der Trematoden. VII, Regeneration in the digenetic trematodes." v, 52 (2), 117-120, 3 figs. [1932.]

(a) Sinitsin has found that there is little or no regeneration of tissues after traumatic injury in such digenetic trematodes as *Fasciola hepatica* and *Fascioloides magna*.

There is little opportunity for trauma except while being ingested, when the thorough mastication of food by the host and the fragility of the desiccated adolescaria combine to render injury possible. Several flukes showing wounds, presumably due to this cause, were found and in each case the healed wounds were incisures in the sides of the body. In each

case the gut branches and the longitudinal and circular muscles failed to regenerate at the site of the scar, the only repair being the formation of a thin layer of cuticle. The author associates this inability to regenerate with the characteristic cell constancy of the *Digenea*. B.G.P.

## 47—Bulletin du Musée Royal d'Histoire Naturelle de Belgique.

*a*. CONINCK, L., DE.—" Nieuwe bijdrage tot de kennis der vrijlevende nematoden van belgie VIII (7), 1-30, 11 figs., 25 refs. [February, 1932.]

(a) De Coninck describes 19 species of previously known free-living nematodes which are new to the Belgian fauna. Preceding the systematic section is an ecological classification of localities in which the worms were found. This paper is supplementary to a former contribution by the same author in 1930. B.G.P.

## 48—Bulletins de la Société de Pathologie Exotique.

*a*. THOULON, L.—" Sur quelques accidents consécutifs à l'infestation filarienne, observés au Gabon (1929-31)." XXV (3), 234-237. [March, 1932.]

*b*. GAUBERT, M.—" Au sujet d'un cas de parasitisme à *Spiroptera* chez un chien." XXV (4), 372-373. [April, 1932.]

(a). Thoulon points out that not all cases of human filariasis in French tropical Africa are benign.

He quotes half a dozen cases in Europeans which were more or less serious. The parasite in each case appears to have been *Loa loa*, and in addition to swellings and eye symptoms, anæmia, nervousness, general pains, pruritis, etc., were observed. T.W.M.C.

(b) Gaubert describes a case of Spiroptera in a dog imported into French West Africa.

He believes that this is the first record of *S. sanguinolenta* from the colony. The symptoms simulated those of Rabies, the animal dying on the twelfth day after the onset of the disease. He draws attention to the desirability of fæcal examination in such cases. T.W.M.C.

## 49—Circular. Bureau of Plant Industry. New Jersey Department of Agriculture.

*a*. GLASER, R. W.—" Studies on *Neoaplectana Glaseri*, a nematode parasite of the Japanese beetle (Popillia Japonica)." No. 211, 34 pp., 17 figs., 18 refs. [April, 1932.]

(a) Glaser summarizes recent work on the part played by helminths in the control of insects and describes experiments with *Neoaplectana glaseri*, an oxyurid parasite of the Japanese beetle.

A 70 per cent. mortality occurs in the grubs and the pupal stages from invasion with second stage larvæ. The mean number of days from infection to death is 11.3. Infection is by the mouth. Two or three generations develop within the body of the grub and these cause death by feeding

upon the tissues. The complete life cycle has been followed on a specially prepared artificial medium consisting of veal infusion agar having a reaction of pH 7.4 to which 2 cc. of a 10 per cent. dextrose solution are added in a sterile 5.5 cm. Petri dish on the day preceding inoculation. About 8 cc. of the melted nutrient agar are poured into the dish and mixed with the sugar solution. When cool the surface is flooded with a suspension of Fleischman's yeast purified from bacteria by plating on dextrose. The plate is incubated at room temperature for 24 hours before the nematodes are introduced. On this medium the life cycle is completed in 4 or 5 days. The ability to develop is lost after a time but can be regained by a number of passages through grubs. Preliminary field experiments indicate the practicability of establishing this nema, as a pathogenic organism, in regions where it does not occur naturally. R.T.L.

## 50—Contributions to Canadian Biology and Fisheries.

*a*. WARDLE, P. A.—"The Cestoda of Canadian Fishes: 1. The Pacific Coast Region." n. ser. VII (15-23), 221-243, 15 figs., 42 refs. [1932.]

(a) Wardle records five species of adult and four species of larval cestodes from 26 species of fish examined in the Straits of Georgia, B.C.

About 1,500 fishes were examined; no cestodes were found in the *Pleuronectidæ*, *Embiotocidæ* and (with a single exception) *Scorpænidæ*, and the rate of infection in other families was low. *Gyrocotyle urna* was found in *Hydrolagus colliei*. The common cestode of the Pacific salmon is *Eubothrium oncorhynchi* sp. nov., closely related to *E. crassum* of Europe. *Bothriocephalus scorpii*, *B. occidentalis* and *Gilquinia tetrabothrius* are the other adult forms found. The larval forms were two species of *Diphyllobothrium*, a species of *Nybelinia* and one of *Phyllobothrium*. They are described and figured. T.W.M.C.

## 51—Gardeners' Chronicle.

*a*. T.H.—"Asparagus Sprengeri." XCI (2362), 266. [2nd April, 1932.]
*b*. CAYLEY, D. M.—"Eelworm in Primula Kewensis." XCI (2366), 331-332, 4 figs. [30th April, 1932.]
*c*. GOODEY, T.—"Galls on Asparagus Sprengeri." XCI (2367), 350. [7th May, 1932.]

(a) T.H. reports an infection of *Tylenchus dipsaci* on *Asparagus Sprengeri*.

The proliferation of basal buds is due to eelworm attack and the size of the galls is due to excessive feeding and watering. T.H. advises that all galls and diseased buds should be removed and burnt and the plants repotted in clean soil. M.J.T.

(b) Caley describes galls containing eelworms on the roots of *Primula kewensis*. The death of the plant was apparently due to the eelworm infection. The galls are figured and described, together with the egg masses they contained. The nematode is not named. M.J.T.

(c) Goodey examined the galls on *Asparagus Sprengeri* referred to in a preceding abstract [(*a*) *supra*] but found no evidence of their being due to attack by *Tylenchus dipsaci*.

Dissections of young galls revealed no nematodes of any sort. Older galls showing discoloration contained a few specimens of free living nematodes of the genus *Rhabditis*. These Goodey regarded as secondary invaders. The structure of the galls was not such as is characteristic of attack by *Tylenchus dipsaci*. M.J.T.

## 52—Indian Journal of Medical Research.

*a*. MAPLESTONE, P. A.—"Further observations on seasonal variation in in hookworm infection." XIX (4), 1145-1151, 2 tables, 2 charts, 2 refs. [April, 1932.]

(a) Maplestone has found that there is, during the monsoon, a marked increase in the number of hookworm eggs in the stools of the local population in and around a jute mill near Calcutta.

About 200 stools from each of three sections of the population were examined by Lane's D.C.F. method and the eggs counted by Stoll's method, each month for a year. The "eggs per cc." values fluctuate round about 300 or 400 except in July or August when they are almost doubled. The proportion of infected persons is not affected. Improved sanitary conditions in the mill produce only a slight reduction in intensity since the population is continually changing. Soil conditions modify ascaris and trichuris as well as hookworm infections.

The annual increase in egg production at the height of the monsoon, which the author has previously observed in tea garden populations, is difficult to explain in view of the accepted fact that there is usually no significant variation in egg-counts even for persons who have avoided re-infection for months or years. B.G.P.

## 53—Indian Journal of Veterinary Science and Animal Husbandry.

*a*. BHALERAO, G. D.—"A general account of the helminth parasites affecting domestic animals in India, with methods of collection, preservation, staining, etc." II (1), 1-28. [March, 1932.]

(a) Bhalerao has written a useful introduction to helminth morphology classification and technique. It does not extend, however, to the diagnosis of the known species of parasites of domesticated animals in India. R.T.L.

## 54—Japanese Journal of Experimental Medicine.

*a*. NAKAJIMA, KATSUMI.—"Experimental study on the development of *Anchylostoma duodenale*. (Third report). Development of larvæ of *Anchylostoma duodenale* Dubini obtained from the lung of percutaneously infected puppy and subsequently given to rabbit." X (2), 115-122, 1 pl., 4 tables, 2 refs. [April, 1932.]

(a) Nakajima describes experiments which result in a decrease of host specificity of *Ancylostoma duodenale*.

Rabbits were orally infected with untreated ensheathed larvæ and larvæ treated with emulsions of the lung tissue of rabbits and guinea pigs. No further development was undergone by these larvæ within the abnormal host. Larvæ obtained from the lungs of puppies gave a similar negative result, but when these were substituted by larvæ which had completed their passage through the lungs of puppies, a small percentage were found to undergo some development within the rabbit. Larvæ treated with an emulsion of human lung tissue continued their development in the rabbit up to the stage of sexual differentiation just prior to the fourth ecdysis. This stage was reached thirteen days after infection. These results point to a marked decrease of host specificity induced by the treatment in the emulsion of tissues of the normal host, and indicate the biological significance of the passage of larvæ through the lungs. M.J.T.

## 55—Journal of Agricultural Research.

*a*. JONES, L. H.—" The effect of environment on the nematode of the tomato gall." XLIV (3), 275-285, 1 fig. 5 tables, 14 refs. [1st February, 1932.]

*b*. ALICATA, J. E.—" Life history of the rabbit stomach worms, *Obeliscoides cuniculi*." XLIV (5), 401-419, 12 figs., 5 tables, 19 refs. [1st March, 1932.]

(a) Jones describes various series of experiments on the effects of moisture and temperature on the development of *Heterodera radicicola*.

A cystic stage comparable to that of *H. schachtii* is described as occurring in galled tomato-roots. The optimum soil-temperature both for tomato growth and for nematode activity was found to be between 25° and 30° C. Experiments are described which showed that few galls were developed on plants grown in soil containing 100 per cent. of its moisture capacity but more were present under these conditions at higher than at lower temperatures. More galls developed in a soil with moisture-content of 60 per cent. to 80 per cent. than in one of 40 per cent., but the latter was insufficient to keep plants alive. The nematodes were found to survive over a period of 31 days in soil with a moisture-content of 10 per cent. to 60 per cent. but failed to survive in air-dried soil. Continuous flooding for 28 days was not effective in destroying the nematodes. The effect of varied periods of desiccation on the nematodes within the gall was found to vary with the size of the gall; when kept in air-dried soil the nematodes in galls of half an inch diameter died out within from one and half to two weeks, while those in galls of three quarters of an inch diameter survived slightly longer. The rate of decay of galls attached to roots was found to be much slower than that of detached galls, but the process of decay was hastened in both cases by a high moisture-content of the surrounding soil. An apparatus for observing the invasion of roots by the nematode larvæ is described and figured. M.J.T.

(b) Alicata has traced the development of *Obeliscoides cuniculi*, a bursate nematode which causes petechial hæmorrhages and areas of inflammation in the stomach of the rabbit.

The eggs give rise to free living larvæ which undergo two moults at room temperature and reach the infective stage in about six days. The infective larvæ are incapable of piercing the skin, are not very resistant to dessication and are destroyed at a temperature of —18° C. in three days. They are repelled by strong light but respond positively to diffuse daylight. In the rabbit and experimentally in the guinea pig sexual maturity is reached in 16 to 20 days. R.T.L.

## 56—Journal of the American Medical Association.

*a.* MILLER, Jr., J. J., McCOY, O. R. & BRADFORD, W. L.—" Intravenous treatment in experimental Trichiniasis." XCVIII (15), 1242-1245, 4 tables, 14 refs. [9th April, 1932.]

*b.* SULLIVAN, S. J.—" *Schistosoma hæmatobium* in Illinois." XCVIII (19), 1642-1643. [7th May, 1932.]

(a) From experimental studies with trichinosed rabbits, Miller, McCoy and Bradford shew that acriflavine, neoarsphenamine, antimony and potassium tartrate, rivanol, gentian violet and iodine and Lugol's solution give no demonstrable therapeutic effect. The value of the occasional injections of such drugs in the treatment of human trichiniasis is questioned. R.T.L.

(b) Sullivan reports the first endemic case of *Schistosoma hæmatobium* in the United States, the previous cases having acquired their infection abroad.

The patient was a boy, 4 years old, born in Northwestern Missouri but taken three weeks later to Chicago and since then he has never been more than one hundred miles away from the city. In the urine three adult worms and many terminal spined ova were found. There were urinary symptoms of frequency of micturition tenesmus and straining. The source of infection was traced to an aquarium in which tropical fish were kept and in which there were snails resembling *Bulinus*. An examination of the water from the fish bowl shewed fully developed cercariæ. R.T.L.

## 57—Journal of the American Veterinary Medical Association.

*a.* STAFSETH, H J. & THOMPSON, W. W.—" The effects, treatment and prevention of worm infestation in poultry." LXXX (3), 467-474, 1 ref. [March, 1932.]

*b.* HALL, M. C.—" Report of Committee on parasitic diseases." LXXX (3), 484-491. [March, 1932.]

*c.* RAWSON, G. W.—" A comparison of carbon tetrachloride and tetrachlorethylene." LXXX (4), 600-603, 7 refs. [April, 1932.]

*d.* TURNER, H. W.—" Field and experimental studies of sheep diseases." LXXX (5), 697-710, 2 figs., 3 tables. [May, 1932.]

*e.* WILSON, H. A.—" Hog-lot sanitation and its relation to swine disease control." LXXX (5), 720-728. [May, 1932.]

*f.* SKIDMORE, L. V.—" *Trichostrongylus colubriformis* (= *T. instablilis*) in the jack rabbit (*Lepus californicus melanotis*)." LXXX (5), 800-801, 5 refs. [May, 1932.]

(a) Stafseth and Thompson consider the treatment and prevention of tapeworms and *Ascaridia* in various species of domesticated birds. Both, when present in numbers, are pathogenic to birds, especially young birds and cause loss of growth, emaciation, and the usual symptoms of parasitism. *R. echinobothridia* causes lesions resembling those of tuberculosis. Colloidal iodine was used on 29 birds with considerable success and field trials also showed that the drug was effective and harmless when properly applied. Prevention consists in the application of our knowledge of the mode of spread of the worms. T.W.M.C.

(b) Hall's report surveys the important parasites of equines, cattle, sheep, pigs and poultry in the U.S. and gives constructive recommendations for their control. He advocates the appointment of at least one veterinary parasitologist to each State for research purposes. [It is impossible to summarize this valuable report which should be consulted in the original.] T.W.M.C.

(c) Rawson gives a general comparison between carbon tetrachloride and tetrachlorethylene. Tetrachlorethylene only occasionally causes inhalation-intoxication and should be administered in soft capsules. It has no appreciable effect on the liver, but dizziness and incoördination may occasionally follow its administration, probably due to excessive doses or fatty food. It is not dangerous in cases of calcium deficiency and Rawson recommends it in preference to carbon tetrachloride for nematode infections. T.W.M.C.

(d) In sheep in the United States the losses due to parasites are enormous and are by far the most important cause of sheep diseases. It has been estimated that they cause 70% to 80% of all diseases in sheep. In the Eastern and Central States the greatest losses are caused by stomach worms, nodular worms and lung worms in lambs. Turner gives an account of the studies in control made by the Pennsylvania Bureau of Animal Industry.

The heavily infested flock was drenched every three weeks with 3 oz. of a 1 per cent. solution of copper sulphate to which had been added 24 minims of Black leaf 40. The average weight increased from 82 lbs. to 88 lbs. between October, 1928 and October, 1930. When slaughtered, 5 out of 23 animals shewed no parasite and others were but slightly infested, chiefly with *Hæmonchus contortus*. To prevent infection of lambs the hay rack was set 12 ins. from the floor and constructed of slats wide enough apart to admit a sheep's head. Apart 18 ins. back of the rack a 10-in. board is set on edge. To reach the hay the sheep must step over this board with the front feet and to prevent all four feet from getting in strips are nailed every 18 ins. from the board to the rack. Under this system the lambs were stalled with the ewes for three or six months until they are weaned. When turned out to pasture the fæces of all the lambs were negative for parasites. 2.5 cc. of tetrachlorethylene was administered in

capsules to each animal at three weekly periods from July 26th, 1928, till April, 1929, when all but three lambs gave fæces negative for parasites. The flock was then divided into four groups, three for treatment, one as control.

In group 1 each received 5 cc. of tetrachlorethylene in 2 oz. of mineral oil. In group 2 each received 2 oz. of a 1 per cent. solution of copper sulphate to which 6 minims of Black leaf 40 had been added. The dose of Black leaf was increased each time until it amounted to 16 minims at each dose. When the lambs were 2 years old the Black leaf was increased again to 24 minims and the copper sulphate 1 per cent. solution to 3 ozs. In group 3 each received 2 to 3 ozs. of a 1 per cent. solution of copper sulphate, and this at two years old was increased to 3 ozs. Group 4 was used as a control and kept during the winter months in sheds with the specially constructed hay racks, while in summer pasture lot rotation was followed at 2 week intervals.

A set of detailed tables is given shewing the parasitic species found and the numbers recovered at post mortem. The conclusion reached is that the parasitic infestation had been controlled to a great extent in all groups, and that in the control group the degree of infestation was no greater than in any of the others. The use of the special hay rack and other sanitary measures sufficed to keep the lambs almost entirely free from parasites in the successive years 1929 to 1931. R.T.L.

(e) In this paper H. A. Wilson refers amongst other things to the McLean County System of Swine Sanitation. He recalls that 80 per cent. success was obtained instead of 3 per cent. in the rearing of hogs. He believes that the weak point in the system is the possibility of the sow being contaminated with internal parasites when placed in the farrowing pen. Given a worm-free sow with good external cleaning and placed in a properly cleaned and disinfected pen, the young offspring should have no chance of obtaining infection during their first days of life. The system is equally effective in controlling other forms of internal parasites as well as *Ascaris*. R.T.L.

(f) The common trichostrongyle of sheep *Trichostrongylus colubriformis* has been found by Skidmore in large numbers in 5 jack rabbits killed in the vicinity of Lincoln, Nebraska.

The other species of the genus which have been recorded from rabbits are *T. retortæformis*, *T. pigmentatus*, *T. calcaratus* and *T. affinis*. R.T.L.

## 58—Journal of the Council for Scientific and Industrial Research.

*a*. ROSS, I. C. & GRAHAM, N. P.—" Parasitological field trials with sheep; results at ' Gundowringa,' New South Wales, and ' Frodsley,' Tasmania." v (1), 31-39. [February, 1932.]

(a) Ross and Graham continue the report commenced in the November, 1931, issue of this journal.

In N.S.W., they find that increased risk of parasitism due to heavy stocking on improved pasture (2½ sheep per acre) was more than off-set by the improved condition of the animals. Sheep run on un-top-dressed natural pasture produced 9 lbs. 8 ozs. of wool and gained 27 lbs. 3 ozs. live weight per acre; on improved pasture without rotation at 2½ sheep per acre, 27 lbs. 13 ozs. wool and 110 lbs. 10 ozs. live weight per acre; and on improved pasture with monthly rotation, 28 lbs. 2 ozs. wool and 138 lbs. 14 ozs. live weight per acre. Medicinal treatment produced no demonstrable effects on the improved pastures, and practically all worm infestations were thrown off naturally by the end of the experiment. The trial lasted 7 months.

In Tasmania, routine monthly dosing with copper sulphate, with or without arsenic, or carbon tetrachloride alone, greatly decreased mortality, caused the increase of ½ to 1½ lbs. of wool and an increase in weight. Licks, while appearing to reduce infections, require further investigation. Nutritional supplements without medicinal treatment lowered the mortality rate but were too expensive, and a combination of both seems desirable.

T.W.M.C.

## 59—Journal of the Egyptian Medical Association.

*a.* AZMY, S. & EFFAT, S.—"Pulmonary Arteriosclerosis of a Bilharzial Nature." XV (3), 87-90. [March, 1932.]

*b.* KHALIL, M. & HASSAN, A.—"A preliminary note on a new skin reaction in human schistosomiasis." XV (4), 129-130. [April, 1932.]

*c.* KHALIL, M. & HASSAN, A.—"The serum globulin in human schistosomiasis." XV (5), 211-231, 14 refs. [May, 1932.]

*d.* SHAHIN, HASSAN —"Migrating tapeworm in the trachea." XV (5), 299. [May, 1932.]

(a) Two cases are described of a bilharzial type of pulmonary arteriosclerosis which Azmy and Effat consider to be quite distinct from the classical specific and non-specific types. In both "There was extensive fibrosis of the lungs, a heavy bilharzial infection, a classical splenomegalic cirrhosis," and both presented the same picture of chronic bronchitis and emphysema with secondary pulmonary dilatation and regurgitation. At post mortem of one of the cases there was Bilharzial fibrosis of the lung with perivascular infiltration of the smaller vessels with Bilharzia ova and a secondary endarteritis obliterans. The pulmonary artery was dilated and atheromatous but no Bilharzia ova were found in its walls.

R.T.L.

(b) Owing to the difficulty of obtaining adult Bilharzia worms from human cases Khalil and Hassan have used an extract obtained from *Schistosoma bovis* of cattle which is readily obtained in Cairo.

They find that of 136 persons whose fæces or urine contained Schistosoma ova all gave a positive skin reaction except four and these were at the time undergoing treatment. The positive reaction usually occurred in fifteen minutes: only in two cases was it delayed for 24 hours. Ten cases who had been cured after treatment gave positive immediate reactions.

R.T.L.

(c) A systematic quantitative study of the serum proteins in Schistosomiasis has been made by Khalil and Hassan. The aldehyde test cannot be relied on as a method diagnosis of Schistosomiasis. Most of the sera from patients with enlarged spleen showed a high percentage of euglobulin without any relation to the presence or absence of Schistosoma infection.

R.T.L.

(d) A soldier with a history of occasional attacks of suffocation died in hospital while under Dr. Shahin's observation from a distressing dyspnœa. At post mortem a tapeworm was found lodged in the larynx and upper part of the trachea. The author quotes from the literature a case in which incision of the drum of the ear for severe earache was followed by the passage of a tapeworm from the middle ear and eustachian tube.

R.T.L.

## 60—Journal of Oriental Medicine.

*a.* HIYEDA, K.—" Distribution of parasitic diseases in Manchuria." XVI (2), [in Chinese: English summary: p. 31.] [February, 1932.]

*b.* WADA, N. & TERADA, B.—" Ueber die Methode der Wertbestimmung der Wurmittel unter Gebrauch von Blutegeln (*Hirudo nipponica*)." XVI (5), [in Chinese: German summary: p. 64.] [May, 1932.]

(a) Hiyeda finds that the distribution of diseases caused by helminth parasites varies accordingly to the latitude of given places along the South Manchurian Railway.

R.T.L.

(b) Wada, under the direction of Terada, has used leeches (*Hirudo nipponica*) for the evaluation of response to anthelmintics, instead of the more usual earthworms which are scarce in winter in Manchuria.

Leeches were fixed by their suckers to the bottom of a tube containing a solution buffered at pH. 8.3. The anterior end of the leech was connected with a stylus by which changes in toxicity were recorded. [Representative graphs appear in the original Chinese section of the paper: the German summary describes responses to various drugs only in generalized terms.]

B.G.P.

## 61—Journal of Parasitology.

*a.* CHANDLER, A. C.—" Susceptibility and resistance to helminthic infections." XVIII (3), 135-152, 1 chart, 41 refs. [March, 1932.]

*b.* STILES, C. W.—" Some practical considerations in regard to control of hookworm disease in the United States under present conditions." XVIII (3), 169-172. [March, 1932.]

*c.* LAMSON, P. D. & WARD, C. B.—" The chemotherapy of helminth infestations." XVIII (3), 173-199, 4 graphs, 6 tables, 4 figs., 90 refs. [March, 1932.]

*d.* OTTO, G. F.—" Ascaris and Trichuris in southern United States." XVIII (3), 200-208, 2 tables, 16 refs. [March, 1932.]

(a) In this address Chandler discusses the two more or less distinct problems of the development of resistance to the effects of helminth infection and the development of resistance to continued reinfection

Resistance to injurious effects is influenced by the species and race of the host. Nutrition also plays an important rôle. Other factors are age, sex, pregnancy, chronic disease, overwork, exposure and various excesses. Specificity in helminth parasites is not nearly so narrow as was once supposed but the determining factors are very imperfectly known and include temperature, hydrogen ion concentration, intestinal flora, digestive fluids and other simple physical or chemical conditions. In their normal hosts larval parasites undergo many wanderings but seldom get lost whereas in abnormal hosts they frequently become aimless wanderers. Host races are, the author believes, the result of selection of genetic races rather than somatic acclimatisation. Hosts may be altered in their susceptibility to parasites to which they are obviously resistant. Vitamin and endocrine relationships are suspected. Acquired resistance to increased infection has been demonstrated in several cases lately and is indicated not only by failure to acquire more parasites but also by loss of those already established and by inhibition of developments and of reproduction. Immunity is at least partly local in nature. R.T.L.

(b) The final problem of hookworm eradication lies, in Stiles' opinion, in the changing of the daily habits of hundreds of thousands of white, Indians, and negroes from the present system of " dog " sanitation to the mosaic of " cat " sanitation which will take at least three further generations of educational health work. Meanwhile he advocates turning to the school teachers and the school organization as a cheaper plan than the one followed at present by the public health authorities in the United States to reduce suffering, increase efficiency and obtain better educational results. R.T.L.

(c) On account of the danger of unpreventable collapse following proper therapeutic doses of thymol, chenopodium or ascaridol Lamson and Ward believe that these anthelmintics should be avoided. Enormous doses of Carbon tetrachloride can be given to animals in proper calcium balance but where a calcium deficiency is present this drug may be very toxic.

It always produces liver damage and a change in metabolism whether or no symptoms appear but even severe liver damage may be recovered from quickly without permanent injury. Tetrachlorethylene is an efficient practical anthelmintic for cases of uncomplicated hookworm disease but is ineffective against Ascaris and may cause undesirable migrations of this worm as in the case of Carbon tetrachloride. Hexyl resorcinol differs from most anthelmintics in acting on several types of parasites although most effective against Ascaris it is a good anthelmintic against hookworm and has a definite action on trichuris, enterobius and cestoda. Toxic symptoms have not been recorded but it acts as a local irritant in the mouth and stomach. The interesting paper includes an extensive list of drugs arranged in a chemical classification, which have been reported to shew anthelmin action. R.T.L.

(d) Otto concurs that the same pollution habits by young children are responsible for the spread of *Ascaris* and *Trichuris* but a greater amount of moisture is required to ensure the development of the eggs of the latter and trichuris families are almost invariably living where the dense shade or poor drainage maintains a moist door yard.

Where soil pollution occurs at some distance from the house infection is low. Where there is little community worm burden, even door yard pollution may be unimportant owing to the absence of an initial infestation while the sandy nature of the soil in some cases is an additional adverse factor. In certain parts of the city of Tampa in Florida the rather heavy ascaris and trichuris infestation is located chiefly among the Cuban cigar makers. In the Mississippi Delta these infestations are rather widespread. Here the heavy clay loam and the almost tropical rainy season provide optimum cultural conditions for the eggs. In the matter of control the rapid reinfections which take place with ascaris after single treatments indicate that anthelmintic action is rather hopeless but Keller's demonstration that sanitation without treatment can effect tremendous reductions within a year suggests the effective use of the privy especially if structurally adopted for children. R.T.L.

## 62—Journal of Preventive Medicine.

*a.* MILLER, Jr., H. M.—" Superinfection of cats with *Tænia tæniæformis*." VI (1), 17-29, 6 tables, 2 figs. [January, 1932.]

*b.* MILLER, Jr., H. M. & MASSIE, E.—" Persistence of acquired immunity to *Cysticercus fasciolaris* after removal of the worms." VI (1), 31-36. [January, 1932.]

*c.* MILLER, Jr., H. M.—" Further studies on immunity to a metazoan parasite, *Cysticercus fasciolaris*." VI (1), 37-46, 4 tables. [January, 1932.]

*d.* KELLER, A. E., LEATHERS, W. S. & BISHOP, E. L.—" A State-wide study of the human intestinal helminths in Tennessee." VI (3), 161-184, 4 figs., 17 tables. [May, 1932.]

(a) Miller shows experimentally that the presence of mature worms of the species *Tænia crassicollis* in the intestine of the cat does not protect the host from subsequent infection. R.T.L.

(b) Miller and Massie find that the acquired immunity which follows an infection of the albino rat with the larval tapeworm *Cysticercus fasciolaris* does not disappear within sixty days following the removal of the larvæ. An average of 77 larvæ resulted from the onchospheres fed to the control rats while in 24 rats their development was completely inhibited after the surgical removal of the initial infections from the liver. R.T.L.

(c) Miller has now found that the active immunity to *Cysticercus fasciolaris* acquired by the albino rat is effective when the rats are fed on onchospheres on the day of the last immunizing injection and even 167 days later. If injections of powdered *Tænia tæniæformis* were begun after the infection with onchospheres, cyst development was not inhibited.

Complete immunity was produced with fresh *T. tæniæformis* which had been kept frozen for 3 months in evacuated ampoules and with powdered material from which the lipoids had been extracted. Powdered *Tænia pisiformis* did not inhibit cyst development. The introduction of living cysticerci, in whole or in fragments, into the peritoneal cavity of rats produced immunization. R.T.L.

(d) During the past fifteen years Keller, Leathers and Bishop have noticed a marked reduction in the incidence of hookworm in the State of Tennessee and now it is not a major public health problem save in sections where the soil conditions are suitable for the development of the worm. The incidence of *Ascaris*, *Trichuris* and *Hymenolepis* remains unchanged. Their prevalence can be lowered (i) by vigorously pursuing privy construction, (ii) by educational propaganda on the importance of hand to mouth transmission of these parasites and the necessity of good personal hygiene. R.T.L.

## 63—Journal of the South African Veterinary Medical Association.

*a*. MÖNNIG, H. C.—"The genus *Agriostomum* with a description of *A. cursoni* n. sp." III (1), 16-21, 6 figs., 7 refs. [April, 1932.]

(a) Mönnig describes *A. cursoni* a new species of *Agriostomum* from the small intestine of a Sassaby (*Damaliscus lunatus*), redescribes *A. vryburgi*, and defines the genus.

The new species resembles *A. gorgonis* but is larger, with larger spicules, while the difference in size between the internal and external teeth is smaller. *A. vryburgi* has double teeth like the other three species, and a small median dorsal plate projects between the three subdorsal teeth. T.W.M.C.

## 64—Journal of Tropical Medicine and Hygiene.

*a*. CAWSTON, F. G.—"Parasites and their environment." XXXV (6), 85-86. [March, 1932.]

*b*. GIRGES, R.—"The ætiology of 'Egyptian Splenomegaly'." XXXV (6), 86-90, 1 fig. [March, 1932.], (7), 99-105, 37 refs. [April, 1932.]

*c*. JONES, S. B.—"Intestinal Bilharziasis in St. Kitts, B.W.I." XXXV (9), 129-136, 14 figs, 9 refs. [2nd May, 1932.]

*d*. GIRGES, R.—"Treatment of *Schistosomiasis hæmatobium*." XXXV (10), 145-154, 10 refs. [16th May, 1932.]

(a) Certain types of environment and food supply favour parasites and their control necessitates a careful consideration of those influences which hinder the breeding of intermediate hosts and encourage resistance to infection.

Fluke disease of stock is contracted, in S. Africa, from grazing where *Limnæa* are attached to the stem of the broad rush. *Physopsis*, the carriers of bilharzia worms of man and sheep, live in pools containing the blue water-lily. R.T.L.

(b) Girges reviews the literature of Egyptian Splenomegaly and elaborates the theory that it is due to the effect of toxins secreted by male *Schistosoma mansoni*, the absence of intestinal symptoms being attributed to the lack of females. R.T.L.

(c) Cases of splenomegaly and hepatic cirrhosis attributed to severe infection with *Schistosoma mansoni* are reported by Dr. S. B. Jones from St. Kitts in the West Indies.

The endemic areas are the villages bordering on the small rivers. Of 125 persons treated 36 per cent. lived on the Wingfield and East Rivers; 32 per cent. on the Cayon River, 13 per cent. on the West Farm and Stone Fort Rivers and 19 per cent. outside these endemic areas. In one of the primary schools in the Cayon River District only one out of 45 boys was free from helminth infection and 22.2 per cent. harboured *S. hæmatobium*. The author discusses the location of the infection in the upper reaches of the water supply of Basseterre. The paper is illustrated by a map and several striking photographs. R.T.L.

(d) Girges discusses the rationale of treatment of cases of *S. hæmatobium* and recognizes four different stages viz.: (a) toxæmic, (b) infiltrative, (c) papillomatous, (d) cirrhotic.

The advantages, indications, contra-indications and technique of perineal cystotomy are taken in turn, with the results and complications. While uncomplicated cases derive great benefit from treatment with antimony alone those with severe sepsis or obvious structural changes benefit but little. The treatment of calculi, periurethral abscess, fistulæ, gynæcologic conditions, stricture, incontinence of urine, malignant disease, cutaneous schistosomiasis, perineal tumours and hydronephrosis are briefly dealt with. R.T.L.

## 65—Leaflet, United States Department of Agriculture.

*a.* NIGHBERT, E. M.—"Controlling stomach worms in sheep and lambs." No. 89, 6 pp., 5 figs. [March, 1932.]

(a) Regular dosing of sheep and lambs with copper sulphate 1 per cent. solution is an effective method of controlling *Hæmonchus contortus*. In the colder parts of the United States the treatment should be repeated every 25 to 30 days and in the warmer southern States every two weeks. To treat some of the common tapeworms at the same time 1 oz. of a 40 per cent. solution of nicotine sulphate should be added to each gallon of the 1 per cent. copper sulphate solution. The method of administering the remedy is carefully described and illustrated. Porcelain or enamelware should be used as the chemical corrodes ordinary metal utensils.

A further aid in control is rotation from permanent to temporary pastures. Moreover by breeding for early lambing the lambs are marketable before they are injured by the stomach worms. R.T.L.

## 66—Marseille Médical.

*a.* JOYEUX, C., HOUDEMER, E. & BAER, J. G.—" Étiologie de la sparganose oculaire." LXIX (9), 405-409. [25th March, 1932.]

*b.* BOUCHER, H.—" Une infection multiple par les helminthes." LXIX (12), 544-547. [25th April, 1932.]

(a) Joyeux, Houdemer and Baer, discussing the etiology of sparganosis and the life-history of the parasite, state that the plerocercoid is differentiated into a more muscular anterior region, the future scolex, which alone penetrates the mucosa in a new intermediate host, and a posterior region which is discarded. Two species of *Diphyllobothrium* may be involved, the plerocercoids favouring cold- and warm-blooded hosts respectively. The restriction of sparganosis to the Far East is probably merely due to the localized custom of applying frogs as poultices to eyes, ulcers, etc. B.G.P.

(b) Boucher gives the clinical history of a case infected with *Schistosoma mansoni*, *Loa loa*, *Ancylostoma duodenale* and *Trichostrongylus* who had been under his care for treatment at Vichy in successive years. R.T.L.

## 67—Medical Journal of Australia.

*a.* BALDWIN, A. H.—" An account of a medical survey of Norfolk Island, directed primarily to the question of hookworm disease, but also including a series of Von Pirquet tests." I (19th year), (16), 543-548, 5 figs., 2 tables, 8 refs. [April, 1932.]

(a) Baldwin found that in Norfolk Island the cattle harboured only *Trichuris ovis* and *Oesophagostomum radiatum*. No endemic cases of hookworm were found out of 143 persons examined and no instance of Filaria infection occurred in the night blood of 80 persons. The absence of hookworm is attributed to the use of the deep pit latrine and to the receptive nature and the depth of the soil. The mosquitoes *Aëdes concolor* and *Culex quinquefasciatus* were collected. The absence of endemic filaria is due rather to climatic than to entomological factors. *Trichuris* and *Oxyuris* ova were each found once. R.T.L.

## 68—Medicina de los Países Cálidos.

*a.* PITTALUGA, G. & GOYANES, J.—" Contribución al estudio de la *Onchocerca volvulus*." V (2), 124-153, 12 figs., 2 pl., 40 refs. [March, 1932.]

*b.* LANDAZURI, E. O., de.—" Parasitismo intestinal en la zona del Protectorado de Espana en Marruecos." V (3), 211-217, 14 refs. [May, 1932.]

(a) Pittaluga and Goyanes have given a detailed account of the morphology and histology of the adults and microfilariæ of *Onchocerca volvulus*.

The work which represents the first of a series of studies on the morphology, histopathological reactions and epidemiological and clinical data of this parasite, proceeds systematically to deal with each organ in turn, the histological details having been made evident by impregnation with silver carbonate by the Del Rio—Hortega technique.
Among the numerous points mentioned the following may be quoted. In the male the large spicule ends distally in a curved, sharp, rose-thorn point and is closely surrounded by a spirally wound chitinoid filament which gives the spicule a striated appearance and is less easily visible in the small spicule also. The cuticle is longitudinally striated. The eggs in utero have opposed polar filaments. The microfilaria is annulated throughout its length and has a chitinoid buccal apparatus which is continuous with a tubular gut. Transverse sections of adult males may show up to eight sections of testis : this leads the authors to suggest that the blind end of the testis may ramify. B.G.P.

(b) De Landazuri gives results of a helminthological survey of the indigenous population in the Spanish zone of Morocco. *Trichuris* was present in 45 per cent. of persons examined (mostly patients at the Tetuan hospital) and *Ascaris* in 16 per cent. An important negative finding was the absence of hookworm. B.G.P.

### 69—Natuurwetenschappelijk Tijdschrift.

*a*. SCHUURMANS STEKHOVEN, Jr., J. H. & CONINCK, L. de.—" Enkele algemeene opmerkingen naar aanleiding van een onderzœk over vrijlevende Nematoden van de Belgische Kust." XIV, 126–129, 1 fig., 3 refs. [1932.]

(a) Schuurmans Stekhoven and De Coninck, in the course of some general observations on free-living nematodes, state that in the larva all the organs, except the reproductive, are already developed and are composed of a fixed number of cells which do not multiply with the growth of the worm but merely increase in size. As a result there is no regeneration of injured parts and in long-tailed forms much of the tail may be lost—a fact which has led to the creation of unjustified " new species." In such forms the commonly used ratios, $\alpha$, $\beta$, $\gamma$, may show great variation. Also, methods of fixation may produce unnatural distortions. Ill-informed, inaccurate and hasty work have produced in the literature a host of errors.
B.G.P.

### 70—Nederlandsch-Indische Bladen voor Diergeneeskunde.

*a*. SMIT, H. J.—" Een bijzonder gastheer." XLIV (2), 174. [April, 1932.]
*b*. PICARD, W. K.—" Pluimveeziekten in Nederlandsch-Indie. Echinostomiasis bij een kip." XLIV (2), 175-177. [April, 1932.]

(a) Smit states that a tom-cat at Buitenzorg harboured *Chlamydonema felineum* in the stomach, and in the intestine *Tænia crassicollis*, *T. elliptica*, *Dibothriocephalus* sp., *Belascaris mystax* and *Ancylostoma ceylanicum*.
B.G.P

(b) Picard records the presence of *Echinostomum* sp. in the rectum and cæca of a White Leghorn fowl, associated with diarrhœa and colitis (and a hypertrophied oviduct and atrophied ovary). The species was the same as that recorded as epizoötic in pigeons in 1929, but here 40 other fowls in the flock were unaffected. B.G.P.

## 71—Nederlandsch Tijdschrift voor Geneeskunde.

*a*. SWELLENGREBEL, N. H.—"Trichinosis in Nederland." 76th Jaarg., I (4), 363-368. [23rd January, 1932.]

*b*. PERK, L. VAN DER.—"Een trichinose-epidemie te Utrecht." 76th Jaarg., II (17), 1949-1956, 1 pl. (French, English and German summaries). [23rd April, 1932.]

(a) Swellengrebel discourses on difficulties of diagnosis, particularly in isolated cases, and on prophylactic measures in trichinosis, under present conditions in Holland.

He recalls a small outbreak in 1909 in Wormerveern, diagnosed and later described by Korteweg, van Asperen and Schmidt (*Ned. Tijd. Geneesk.*, 1910, II, pp. 1384-1507). Nine cases occurred simultaneously in the practices of the three doctors, who then cooperated and, owing to the existence locally of malaria, made blood examinations which led to the discovery of an eosinophilia varying from 9 to 16 per cent. Other symptoms were general fatigue, fever, and œdema of the eyelids. There was no trace of helminth ova or larvæ in the fæces. *Trichina* was diagnosed and a local scare resulted. In the search for conclusive evidence no larvæ were found in the blood, but they were finally located in a piece of biceps excised near the tendon.

*Trichina* in pigs is spread by the habit of feeding them on offal from slaughter-houses and restaurants and by reservoir infections in dogs, cats and rats. A complete system of inspection for trichina is very expensive: the discovery of each trichinous pig in Berlin cost the city 1,100 Marks in 1883, and 17,000 Marks in 1917. In Holland, where the incidence is low, it is better to rely on personal prophylaxis and especially on the thorough cooking of pig meat,—boiling rather than roasting. While the cysts are killed by a temperature of 70° C., a piece of meat 10 cm. thick, requires to be boiled for at least 2½ hours. B.G.P.

(b) Van der Perk gives clinical notes on 9 cases of trichinosis in two families in Utrecht. Diagnosis, based on general symptoms and an eosinophilia ranging from 30 to 56 per cent., was confirmed by finding unencapsulated larvæ in a piece of biceps muscle excised from one patient. Facial œdema, pains in the eyes and neck and general muscular cramp, following abdominal pains, were the principal symptoms. The eosinophilia fluctuated considerably in some cases and, like the temperature, bore no relation to the severity of the illness. Apart from one doubtful find, the examination of blood for larvæ gave negative results. The feeding of the excised muscle to a rat was also negative, possibly because

the larvæ were too young or, being without capsules, could not pass alive through the rat's stomach and duodenum. All the patients had eaten raw minced pork.

The author recommends a tightening up of the regulations for meat inspection and condemnation. In the matter of expense, one should consider not so much the cost per condemned carcase (as suggested by Swellengrebel) as the cost per inspected pig or per pound of pork—this would not be great. B.G.P.

## 72—North American Veterinarian.

*a.* REBRASSIER, R. E.—" Sugar solution for condensing worm parasite eggs in fæcal examinations." XIII (5), 4. [May, 1932.]

*b.* ANON.—" The Swine kidney worm." XIII (5), 38. [May, 1932.]

*c.* YOUNG, F. B.—" The use of santonin in unthrifty pigs." XIII (5), 38. [May, 1932.]

*d.* GRINI, O.—" Parasitical diseases in rabbits." XIII (5), 40-42. [May, 1932.] Abstract by C. A. Nelson. Original in Norsk Veterinær. Tidskrift., June, 1930.

(a) Rebrassier recommends a sugar flotation technique for helminth eggs instead of salt.

He uses 1 lb. of sugar to 12 ozs. of hot water and adds 1 per cent. phenol as a preservative. The mixture of eggs, fæces and solution is strained through a tea strainer. T.W.M.C.

(b) The editor draws attention to the losses caused by *Stephanurus*, amounting to 27 per cent. of the pigs slaughtered in some parts of the southern United States.

He recommends that pigs should be weaned as early as possible and moved to a clean pasture to shorten the time of exposure to infection. Well drained pasture free from trash is important. T.W.M.C.

(c) Young believes that santonin is the only safe anthelmintic for use in unthrifty pigs. T.W.M.C.

(d) Grini surveys the various diseases of rabbits of parasitic origin in Norway—protozoal as well as helminthic.

27 out of 41 examined had lungworms, generally *Strongylus commutatus*, but occasionally *S. capillaris*. *Tænia pectinata* was observed in three cases. *Andrya pectinata* and *A. cuniculi* as well as *C. pisiformis* and *C. serialis* were observed.

*Distomum hepaticum* and *D. lanceolatum* occur in animals with lessened resistance. In Germany *Strongylus strigosus* causes a considerable loss through anæmia. So also do *Strongylus retortæformis* and *Trichocephalus unguiculatus*; *Oxyuris ambigua* is comparatively harmless.

T.W.M.C.

## 73—Parasitology.

*a.* SCHULZ, R. E. & LUBIMOV, M. P.—" *Longistriata skrjabini* n. sp. (Nematoda, Trichostrongylidæ) from the Ussuri Squirrel." XXIV (1), 50-53, 2 figs., 4 refs. [March, 1932.]

*b.* MOGHE, M. A.—" Two new species of Trematodes from an Indian Ruff (*Philomachus pugnax* Gray)." XXIV (1), 54-59, 4 figs., 13 refs. [March, 1932.]

*c.* AUGUSTINE, D. L. & THEILER, H.—" Precipitin and skin tests as aids in diagnosing trichinosis." XXIV (1), 60-86, 1 fig., 1 pl., 6 tables, 14 refs. [March, 1932.]

*d.* TSENG, SHEN.—" Studies on avian cestodes from China. Part I. - Cestodes from Charadriiform Birds." XXIV (1), 87-106, 37 figs. [March, 1932.]

(a) Schulz and Lubimov describe a new species of Trichostrongyle, *Longistriata skrjabini*, from *Sciurus bulgaris mantschuricus*.

The new species differs from the others of the genus by its characteristically short ridges situated in chess-like order. The male is 4.2-4.85 mm. and the female 5.45-5.85 mm. long. A list of species at present included in this genus is also given. T.W.M.C.

(b) Moghe records *Echinostomum govindum* n. sp. and *Paramonostomum microstomum* n. sp. from the Indian Ruff.

*E. govindum*, which occurs in the cæca is 4.6-4.94 mm. long and possesses 32 cephalic spines. It differs from the only other species with a similar number (*E. australe*) in dimensions, size of suckers and hooks, size of eggs, and in the fact that the ovary lies in the posterior half of the body. *P. microstomum* which occurs in the posterior part of the small intestine is 1.348-1.624 mm. long. It is compared with *P. alveatum* and *P. echinum*. T.W.M.C.

(c) Augustine and Theiler, using Bachman's antigen prepared from dried Trichinella larvæ, have tested its effects as a precipitin test and intradermally in laboratory animals, man and pigs.

In guinea pigs and rabbits, their results agreed closely with those of Bachman. Established trichinosis in man was always detected by the precipitin test—but this test is also positive for subjects receiving quinine treatment for malaria. The test is highly specific for pigs. When high dilutions of the antigen are used, the test is highly specific for both man and pigs—a coloured plate shows this—and the reaction is positive in the early stages of the disease and is of the intermediate type. The authors find it more accurate than muscle examination in pigs. T.W.M.C.

(d) Tseng records 19 species of avian cestodes collected in China by Faust in 1920-22. Four species are new.

The new species are as follows : *Amœbotænia fuhrmanni* from *Gallinago* sp. characterised by 10 rostellar hooks, 70$\mu$ long, small testes and short cirrus sac. It is 1.5 to 4.77 mm. long. *Amœbotænia pekinensis* from *Charadrius veredus* with the testes extending transversely to the margins in the posterior part of the segment and 16 rostellar hooks, 54 to 61$\mu$ long. Its minimum length is 3 mm. (A table of the various species of this genus

is given). *Monopylidium guiarti* from *Aegialitis minor* and *A. curonica*, 17 mm. long, with 30 hooks and differing in its internal anatomy from the other species in this genus. *Choanotænia joyeuxi* from *Scolopax rusticola*, 45 mm. long with 10 rostellar hooks in a single row. T.W.M.C.

### 74—Philippine Journal of Science.

*a.* TUBANGUI, M. A.—" Trematode parasites of Philippine vertebrates, V : Flukes from birds." XLVII (3), 369-402, 5 figs., 30 refs. [March, 1932.]

*b.* TUBANGUI, M. A.—" Observations on the life histories of *Euparyphium murinum* Tubangui, 1931, and *Echinostoma revolutum* (Froelich, 1802), (Trematoda)." XVLII (4), 497-511, 12 refs. [April, 1932.]

(a) Philippine representatives are reported by Tubangui, for the first time, of the monostome and holostome groups of trematodes.

New species in the following genera are discussed :—*Cyclocœlium*, *Notocotylus*, *Philophthalmus*, *Leucochloridium*, *Glyphrostomum*, *Echinostoma*, *Echinochasmus*, *Strigea*, *Cotylurus* and *Proalaria*.

The domestic ducks in the Philippines are infected with *Notocotylus intestinalis* n. sp., *N. naviformis*, n. sp., *Philophthalmus rizalensis* n. sp., and the following species which occur also in birds in Europe :—*Psilochasmus longicirratus*, *Echinostoma revolutum* and *Echinoparyphium recurvatum*.

R.T.L.

(b) Tubangui found two kinds of Echinostome cercariæ encysted in *Lymnæa peregra*. Those with 37 cephalic spines became adult *Echinostoma revolutum* in pigeons but failed to develop in rats or a monkey ; those with 45 cephalic spines developed into adults in white rats but not in pigeons or a monkey and proved to be *Euparyphium murinum* Tubangui, 1931. R.T.L.

### 75—Phytopathology.

*a.* GODFREY, G. H. & OLIVEIRA, J.—" The development of the root-nematode in relation to root tissues of pineapples and cowpea." XXII (4), 325-348, 12 figs., 2 tables, 23 refs. [April, 1932 ]

*b.* AMERICAN PHYTOPATHOLOGICAL SOCIETY —" Report on the 23rd Annual Report of the American Phytopathological Society. Committee on quarantine and regulatory work." XXII (5), 481-482. [May, 1932.]

(a) Godfrey and Oliveira have made a comparative study of the invasion of pineapple and cowpea roots by the larvæ of *Heterodera marioni* (syn. *H. radicicola*), and the resultant tissue reactions of the two hosts.

Methods of inoculating roots, fixing and staining with Flemming's solution and photographing the specimens are described in detail. Root penetration commenced within 6 hours of inoculation and continued for 24 hours. Large numbers of larvæ usually entered the roots near the same point which is normally in the meristematic tissue behind the root cap but penetration may be effected through the root cap. The larvæ migrate for two or three days and finally become orientated within the cortex with

their heads embedded in the endodermis or pericycle, after which no further movement takes place except in the case of the mature males. Enlargement of roots in the early stages is due to retardation of forward growth, true gall formation with giant cell production begins only after the migration and orientation processes are complete. Pineapple roots rarely continue growth after the formation of a gall but cowpea roots normally resume growth after a period following a light infestation. The period between inoculation and egg production differ in the two hosts, being 19 days in the cowpea, 35 in the pineapple. Egg masses are freed early from cowpea roots by breaking through the tissues, but remain within the galls of pineapple roots. This still further delays the life cycle in the latter host. M.J.T.

(b) At the annual meeting of the American Phytopathological Society a discussion on " Nematodes as a Quarantine Problem " was held by the committee on quarantine and regulatory work. The main points raised related to whether nemic diseases were increasing in distribution and importance and whether they were controlled by climatic conditions in the northern states or could be satisfactorily treated by suitable crop rotation. The question was also raised as to the advisability of instituting quarantine procedures while insufficient was known regarding the nematodes and the diseases which they produced to render accurate diagnosis possible.

Following discussion on these points the general opinion expressed was that quarantine was only advisable in special cases where sufficient data were available to justify action being taken. It was stated that the general lack of knowledge regarding nematodes was such as to cause great difficulty in making decisions regarding regulatory measures, and that although in some districts attention was being given to specific diseases due to nematodes no general investigations on nematode problems were in progress.

Following reports on the recent spread of *Tylenchus dipsaci* among sweet potatoes in New Jersey, a resolution was drawn up advising the Federal authorities to determine the distribution of this nematode which threatened to become a serious pest of a valuable crop, and to circulate all available information regarding the disease to all plant-pathologists, horticulturists and other interested parties. M.J.T.

## 76—Policlinico. [Sezione Medica.]

*a.* LONGO, D.—" Intradermoreazioni specifiche e aspecifiche nell' echinococcosi." XXXIX (4), 202-208, 2 tables, 23 refs. [April, 1932.]

(a) Longo finds that Casoni's intradermal test for hydatid is strictly specific in respect of the delayed reaction. The immediate reaction is not truly specific in that it sometimes appears in non-carriers and is frequently simulated by a reaction to peptone broth in both carriers and non-carriers.

The value of the Casoni reaction has been recently questioned, notably by Burnet, Caillon and Brun (*Arch. Inst. Pasteur Tunis*, 1927) and Longo here seeks to test the findings of the French authors by applying their technique to 100 non-carriers and 11 carriers of hydatid. In each case inoculations were given of 0.5 cc. of each of the following : (i) pure hydatid fluid from several bovine cysts, (ii) physiological solution as control, and (iii) ordinary peptone broth. Among the 100 non-carriers 4 gave an immediate reaction lasting about 2 hours, and 19 a slight transient reaction, to hydatid fluid. To peptone broth 85 reacted immediately producing an erythematous wheal similar to the above, and the other 15 gave a transient reaction. Of the 11 carriers, 8 gave a typical immediate reaction to hydatid fluid followed by a delayed reaction (œdematous zone with erythematous striæ, lasting 24 hours), 2 gave only the immediate reaction and one failed to react. To peptone broth 9 gave an immediate and 2 a transient reaction. B.G.P.

## 77—Policlinico. [Sezione Pratica.]

*a*. PIERI, G.—"Appendicite acuta da tricocefalo." XXXIX (12), 458-460, 1 fig. [21st March, 1932.]

*b*. CONTE, G.—"Ileo complicante un tifo ambulatorio diagnosticato ileo verminoso." XXXIX (19), 727-731, 7 refs. [9th May, 1932.]

(a) Pieri gives clinical details of an acute appendicitis in a boy of seven, in which the marked clinical symptoms were quite disproportionate to the actual lesions, a condition which he explains by the presence of three trichocephalus worms in the appendix.

The clinical syndrome suggested a very severe appendicitis probably complicated by a circumscribed peritonitis. At appendicectomy, however, the organ was found to be normal in external appearance ; there was a trace of serous fluid in the peritoneal cavity and a slight reddening of the serous coat at the proximal end of the appendix. A blood clot in the lumen contained a trichocephalus and some eggs : two more worms were attached to the mucosa. Sections of the latter showed hyperæmia with extensive zones of lymphocytic and leucocytic infiltration and slight localized hæmorrhages. It is suggested that the mechanical and toxic effects of the parasites, possibly complicated by bacterial invasion through the mucosal lesions they occasion, produced an irritation of the intraparietal nerves which, with reflex repercussions, might well explain the symptoms. B.G.P.

(b) Conte gives full clinical details of a fatal ambulatory typhoid, with perforation, in a boy of six, complicated by stenosis at the ileo-cæcal valve due to a bolus of ascaris worms.

The previous history included the passing of numerous ascaris a few days before and misled the author and two consultants into diagnosing simply "ileus verminosus." During the operation which was decided upon, the patient died. B.G.P.

## 78—Porto Rico Journal of Public Health and Tropical Medicine.

*a.* BACHMAN, G. W. & RODRIGUEZ-MOLINA, R.—" Skin reactions to *Necator americanus* in persons infected with the common intestinal parasites." VII (3), 287-320, 13 tables, 21 refs. [March, 1932.]

*b.* HOFFMAN, W. A., MARÍN, R. A. & BURKE, A. M. B.—" Filariasis in Porto Rico." VII (3), 321-358, 26 tables, 19 refs. [March, 1932.]

*c.* DAENGSVANG, S.—" An epidemiological study of hookworm disease in a rural coastal plain and a city area of Porto Rico." VII (3), 359-375, 1 table, 15 refs. [March, 1932.]

(a) The experimental results of extensive studies of Bachman and Rodriguez-Molina demonstrate that in certain persons there is a marked intracutaneous hypersensitiveness to extracts of *Necator americanus*.

For practical use the measurable characteristics of the skin test in detecting the presence of *N. americanus* in individuals infected with two or more intestinal nematodes are too variable and the reactions are not significantly specific. Positive cutaneous reactions in cases with negative stools, amounting to 81 per cent. to 98 per cent. of all Porto Ricans examined, demonstrate that sensitiveness may persist indefinitely after cessation of the parasite. Ascaris extracts gave results comparable with those of *Necator americanus*. It is to be assumed that sensitivity to *N. americanus* is a group phenomenon due to the presence of intestinal nematodes. There is a high correlation between infection with Ascaris and Trichuris and sensitivity to extracts of *N. americanus* but probably a large number of the cases have had a previous Necator infection. The authors find no relation between the size of the wheal or the erythema and the incidence of infection, and attribute the immediate positive reactions, which are not really atropic in character, to exposure and infestation.

R.T.L.

(b) In Porto Rico filariasis is mainly limited to the coastal region. Owing to the aridity of the southern coastal fringe west of Guayana filariasis is of little importance except in Ponce where conditions favour congestion of the population and mosquito breeding.

The city of Caguas and the municipality of San Sebastian are examples of inland centres of filariasis. The occupations of chauffeur and policeman are especially liable to infection owing to the nocturnal duties they involve. The etiology of tropical lymphangitis and elephantiasis are regarded as undetermined but it is noted that these affections occur chiefly along the margin of the island where *Culex fatigans* abounds. A single case of *Filaria ozzardi* was observed in a person who has always resided in Porto Rico.

R.T.L.

(c) An epidemiological survey was carried out by Dr. S. Daengsvang on the rural population in two areas of Finca La Sardinera on the coastal plain near Dorado, Porto Rico. The object being to compare the situation in the rural coastal plain not yet influenced by sanitation and treatment with a city area which had come under the control of the public health department. The author concludes from his studies that the areas of

pollution in the bushes around the houses and sugar cane fields, and not the door-yard pollution by the children, were the important sources of hookworm infestation. R.T.L.

## 79—Proceedings of the Royal Physical Society.

*a.* CAMERON, T. W. M.—" Some notes on the parasitic worms of the Scottish red deer." XXII (2), 91-97. [1932.]

(a) Cameron is investigating the distribution and control of helminth parasites of red deer in Scotland. Results already obtained show that the more important species are the lung-worm *Dictyocaulus vivipárus* (also in cattle), the stomach worm *Ostertagia cervi* (peculiar to deer) and the intestinal worms *Monodontus trigonocephalus* and *Moniezia expansa* (both also in sheep).

Other species include *Elaphostrongylus cervi* and the sheep parasites: *Fasciola hepatica, Hæmonchus contortus, Nematodirus* sp., *Trichocephalus ovis, Chabertia ovina, Œsophagostomum venulosum and Cœnurus cerebralis.* The biology, life-history and control of these parasites are briefly discussed, their dissemination through overcrowding and the presence of alternative hosts is stressed, and it is suggested that the only therapeutic measure likely to have any success is the provision of such a tonic and anthelmintic lick as coarse tobacco, bone meal and salt in the proportions 2 : 5 : 2.

B.G.P

## 80—Proceedings of the Society for Experimental Biology and Medicine.

*a.* MILLER, Jr., H. M. & KERR, K. B.—" Attempts to immunize rabbits against a larval cestode, *Cysticercus pisiformis*." Preliminary paper. XXIX (5), 670-671, 1 table. [February, 1932.]

*b.* MILLER, Jr., H. M. & GARDINER, M. L.—" Protection of the rat against infection with a larval tapeworm by serum from immune rats." XXIX (6), 779-780, 2 tables. [March, 1932.]

(a) In rabbits infected with *Tænia pisiformis* from the dog and subsequently fed with the onchospheres of this species Miller and Kerr found at autopsy 3 to 6 weeks later that in only a few of the experimental animals were larvæ migrating while in the controls migrating larvæ of large size were frequently found in the liver. In some cases the animals had been infected previous to purchase and these shewed evidence of protection against super-infection. R.T.L.

(b) The results of two experiments by Miller and Gardiner tend to shew that complete protection against *Cysticercus fasciolaris* is secured by the injection of rats with serum from rats infected with cysticerci.

Injections were given two hours after a suspension of onchospheres was administered by stomach tube. In one experiment the rats received pooled serum from infected rats, in the other from artificially immunized rats.

R.T.L.

## 81—Recueil de Médecine Vétérinaire Exotique.

GEOFFROY & POISSON.—" Sparganose du Porc à Madagascar." v (1), 21-22, 1 fig. [January-March, 1932.]

(a) Geoffroy and Poisson record several cases of Sparganum from pigs slaughtered in Madagascar.

The parasites were on the outside of the stomach and on the diaphragm, etc. Placed in saline, they moved with a worm-like motion. They are 3 to 6 cm. long, flat and white in colour. There is a laboratory record of a small species of *Diphyllobothrium* from a dog fed for four months on measly pork. It is not *D. latum* and the authors regard the pork as harmless for man. T.W.M.C.

## 82—Revue de Médecine et d'Hygiène Tropicales.

*a*. JAME, L. & JUDE, A.—" Hydrocele filarienne." XXIV (1), 17-20. [January-February, 1932.]

*b*. BOUCHER, L.—" Une infection multiple par les helminthes." XXIV (2), 79-82. [March-April, 1932.]

(a) The clinical history is given of a case of hydrocele contracted apparently during a long residence in Martinique. It showed two noteworthy features, viz. :—the hydrocele was unilateral and there was a complete absence of eosinophilia. Numerous filaria embryos were present in the blood. R.T.L.

(b) This article is reproduced verbatim in the *Marseille Medical*, Vol. LXIX, No. 12, pp. 544-547, 25th April, 1932. [The author's initial is there given as H. and here as L.] R.T.L.

## 83—Revue Suisse de Zoologie.

*a*. BAER, J. G.—" Contribution à la Faune helminthologique de Suisse." [Pt. 2.] XXXIX (1), 1-56, 1 pl., 32 figs., 70 refs. [January, 1932.]

*b*. SCHOPFER, W. H.—" Recherches physico-chimiques sur le milieu intérieur de quelques parasites." XXXIX (1), 59-194, 12 figs., 27 tables, 64 refs. [January, 1932.]

*c*. BAER, J. G.—" Contribution à l'étude des Cestodes de Cétacés." XXXIX (1), 195-228, 17 figs., 32 refs. [January, 1932.]

(a) Baer has contributed to the helminthic fauna of Switzerland an account of 48 parasites recovered at autopsy from 285 vertebrates, mostly small mammals.

The hosts were 158 rodents of several species, 95 insectivores, 7 carnivores, 7 birds and 18 reptiles and batrachians, and the helminthic material, which is described in zoological arrangement under each of these vertebrate headings, consisted of 25 species of cestodes, 15 of trematodes and 8 of nematodes.

The record of *Nephrotrema truncatum* in *Neomys fodiens* and *Talpa europæa* is made the occasion for some remarks on the family Troglotrematidæ, and figures are given for the diagnosis of species of Hymenolepis, from rodents

and shrews respectively, by reference to the size and shape of the hooks. New forms included in this paper are *Monopylidium hepaticum* n sp. and *Hymenolepis toxometra* n. sp. both from *Sorex araneus*, and *Haplometra cylindracea allometra* n. sub-sp. from *Rana agilis*. This account is supplementary to one previously published (*Rev. Suisse Zool.* 1928, xxxv, 27).

B.G.P.

(b) Schopfer has investigated the molecular concentration of electrolytes in the cœlomic and tissue fluids of various helminths, and that of the environing host fluids and tissues, from the point of view of fundamental host-parasite relationships; he has also investigated osmosis in the system: intestinal fluid of host—cuticle of nematode—cœlomic fluid of nematode, in *Ascaris megalocephala*. In general there is a tendency towards equilibrium in both concentrations and pressures operating in both directions. In a second part he has elaborately applied these and other physico-chemical tests to the cystic fluid of *Cysticercus tenuicollis* from sheep.

The molecular concentration was measured in terms of the depression of the freezing point (determined cryoscopically with an accuracy of 1/500° C.), and the effects of osmosis in terms of change in weight of the ascarids (mouth and anus ligatured). The cœlomic fluid of ascarids from horse, sheep, pig and ox has a molecular concentration which is similar to, but slightly less than, that of the intestinal fluid of the host, and which is almost identical with that of the host tissues (" milieu intérieur "). Whether or not this equilibrium is partly attained via mouth or anus and intestine, immersion in hypo- and hypertonic solutions (with mouth and anus ligatured and vulva suspended out of the solution) shows that endosomosis and exosmosis of water occur, to and from the cœlomic fluid, through the cuticle. Ascaris is thus poikilo-osmotic.

In the case of *Fasciola hepatica* the molecular concentration of tissue extracts is much higher than that of normal bile, but in parasitized animals the bile has a value closer to that of the flukes, owing partly to parasite excreta and host blood in the bile. Moreover the parasite value is very close to that of the host's liver extract. Cestodes of mammals give a value slightly lower than that of the intestinal fluid of the hosts. Parasites of marine fish also reveal a close correspondence, but those of fresh-water fish have a concentration much higher than that of the host. Molecular concentration cannot be invoked to explain parasitic specificity.

The work on *Cysticercus tenuicollis* comprised determinations of physical (specific gravity, molecular concentration, surface tension, hydrogen ion concentration, refractive index) and chemical (dry weight, ash, organic and mineral matter in detail, water, total nitrogen) values for the cystic fluid and general chemical values for scolex and membrane. In addition to the cystic fluid within the vesicular (parasitic) membrane there is, between the latter and the cuticular (host) membrane, a varying small quantity of fluid with very different physico-chemical characteristics. The cuticular is a non-selective membrane while the vesicular is, when

living, a selective semi-permeable membrane. The cystic fluid bears a similar relation to sheep's blood as does cerebro-spinal fluid to serum: rich in chlorides, poor in proteins, but with an identical molecular concentration. The external fluid (between the membranes) is on the other hand very similar to the host's serum. The former is a dialytic transudate: the latter a grossly filtered exudate. The paucity of proteins and excess of sugars in the cystic fluid indicate that the cyst is nourished mainly by sugars.

Upon the death of the parasite the vesicular membrane loses its selectivity and the cystic fluid its individual character; the cyst decreases in volume by loss of water and calcification sets in—as a sequel and not a cause of death. B.G.P.

(c) In this paper Baer reviews, and redescribes from Museum material, the adult and larval cestodes of Cetacea.

Four species of *Tetrabothrius* are included, and for two others new genera are here erected: *Trigonocotyle* n.g. for *T. monticellii* from *Globicephalus melas*, and *Strobilocephalus* n.g. for *T. triangularis* from *Hyperoodon rostratus*, *Lagenorhynchus acutus* and *Delphinus* sp. The family Tetrabothriidæ is further represented by two species of *Priapocephalus*, and the only other family of adult cestodes, Diphyllobothriidæ, by *Diphyllobothrium stemmacephalus* and *Diplogonoporus balænopteræ*. The status of the family Tetrabothriidæ is reviewed.

Owing to great confusion in the literature and to ignorance concerning the adults, the larval cestodes are classified for convenience in two groups: the *delphinii* group in which the larva is a plerocercoid, and the *grimaldii* group in which it is a cysticercus. The paper concludes with a host-list. B.G.P.

## 84—Science.

*a*. MILLER, Jr., H. M. & GARDINER, M. L.—"Passive immunity to infection with a larval tapeworm of the albino rat." LXXV (1940), 270. [4th March, 1932.]

*b*. CANAVAN, P. N.—"Spread of broad fish tapeworm of man." LXXV (1943), 337. [25th March, 1932.]

*c*. McCOY, O. R.—"Size of infection as an influence on the persistence of adult Trichinæ in rats." LXXV (1944), 364-365, 1 table, 3 refs. [1st April, 1932.]

*d*. AMEEL, D. J.—"The muskrat, a new host for Paragonimus." LXXV (1945), 382, 3 refs. [8th April, 1932.]

*e*. ARANT, F. S & KNAPP, R.—"A simple method of rearing and mounting hookworm larvæ." LXXV (1949), 495-496. [6th May, 1932.]

*f*. CRAIG, C. F.—"The possible chemotactic effect of the salivary secretions of certain insects upon Microfilariæ." LXXV (1952), 561-562. [27th May, 1932.]

(a) Miller and Gardiner found that serum from immunized rats partially protected the albino rat from infection with onchospheres of the cat tapeworm *Tænia tæniæformis* (*T. crassicollis*). Immunization followed a series of six intraperitoneal injections of a 1 per cent. suspension of powdered tapeworm material. R.T.L.

(b) Canavan has recently found a case of *Diphyllobothrium latum* in a 31 year old labourer in Oklahoma. The patient was a native of Finland but had been 15 years in America. Three months previously he had gone to Oklahoma from Louisiana. The danger of the parasite becoming endemic in the Southern United States is remote owing to the absence of cold water lakes and suitable fish intermediaries. R.T.L.

(c) According to McCoy the length of time that adult *Trichinella spiralis* persist in the intestine of the rat is largely influenced by the numbers present. Apparently a heavy infection breaks down a resistance which ordinarily limits the life of the adults. Guinea pigs have a much lower resistance than rats, while rabbits react similarly to these. R.T.L.

(d) In two localities in Western Michigan, Ameel has found *Paragonimus* to occur to the extent of 12 per cent. in the wild musk-rats. Previously 17 per cent. of the minks from Michigan and Northern Ohio had been found by the author to be infected. R.T.L.

(e) Arant and Knapp have found that hookworm larvæ can be obtained for teaching purposes if the fæces is mixed with charcoal in a flat-bottomed watch glass and then placed in large shallow pans containing water about a quarter of an inch in depth, covered with a plate of glass and incubated at room temperature until the desired stage of development is reached.

The larvæ which had migrated into the surrounding water were isolated by straining through several layers of cheese cloth into a special funnel, the lower contents of which were drained off after 6 to 10 hours, or alternatively by an adaptation of the Baermann method.

For mounting larvæ hæmatoxylin proved more a serviceable stain than Congo red or Orange G and alum cochineal. The larvæ were killed in 5 per cent. alcohol transferred after 15 minutes to 70 per cent. alcohol and for mounting were transferred to a slide in a drop of alcohol which was then ignited and the larvæ, fixed to the slide, were then stained by a drop of Delafield's Hæmatoxylin, washed, dried off and mounted in Canada Balsam. R.T.L.

(f) Craig quotes Strong's observations (1931) on Onchocerca and Ashburn and Craig (1907) on *Filaria philippinensis* which indicate that the bites of bloodsucking insects induce a local concentration of embryos which may be due to the injection of secretion and may prove of diagnostic value in cases, e.g., of elephantiasis, in which embryos are seldom found.

R.T.L.

## 85—Scientific Agriculture.

*a*. RAYNER, J. A.—"Parasites of wild birds in Quebec." XII (5), 307-309, 1 ref. [January, 1932.]

(a) Rayner, in the course of work on poultry parasites, has examined the endo- and ecto-parasites of several wild birds in the vicinity of Quebec. From 9 species of birds he records about a dozen helminths (mostly not specifically diagnosed) which appear not to be fowl parasites. B.G.P.

## 86—Taiwan Igakkai Zasshi.

*a.* SUZUKI, S.—" On several cercariæ infesting Lymnæas in the surroundings of Taichu." [Translation from Japanese text.] XXXI (2), 15. [February, 1932.]

*b.* KATSUTA, I.—" Studies on trematodes whose second intermediate hosts are fishes from the brackish waters of Formosa." 3rd Report. [Translation from Japanese text.] XXXI (2), 16, 8 figs. [February, 1932.]

*c.* KATSUTA, I.—" Studies on trematodes whose second intermediate hosts are fishes from the brackish waters of Formosa. 4th Report. On a new trematode ' Monorchotrema yokogawai ' of which the mullet is the second intermediate host." [Translation from Japanese text.] XXXI (3), 25-26. [March, 1932.]

*d.* ISHII, Y. & YAMASHIRO, R.—" Experimental studies on the appearance of Ascaris-larvæ in the urine." [Translation from Japanese text.] XXXI (3), 27. [March, 1932.]

*e.* KATSUTA, I.—" Studies on Trematodes whose second intermediate hosts are fishes from the brackish waters of Formosa, V." XXXI (4), 40-00. [April, 1932.]

(a) In 3,430 specimens of " Lymnæas " collected in the neighbourhood of Taichu, Formosa, the author has found in 1.19 per cent. of *Lymnæa swinhœi* a cercaria which develops into *Echinostoma revolutum*. In 2.59 per cent. of *L. swinhœi*, 7.14 per cent. of *L. swinh. yokogawai* and 5.94 per cent. of *L. swinh. suzukii* cysts which develop into *Echinoparyphium koidzumii* in the intestine of the fowl.

In 0.26 per cent. of *L. swinhœi* was also found a Xiphidiocercaria. *Cercaria undecima* Faust, is another somewhat more slender Xiphidiocercaria which occurs in 0.13 per cent. of *L. swinhœi*. A furcocercaria with two eyespots and a comparatively big tail occurred in 1.79 per cent. of *L. swinhœi* and exceptionally in *L. swinh. yokogawai*. R.T.L.

(b) The development of a new species of *Monorchotrema*, named by Prof. Yokogawa *M. microrchia*, is described.

It encysts in the scales, gills and fins, but not in the muscles of the Mullet. The worm measures only 0.587 mm. in length by 0.233 mm. in breadth. The ventral sucker is peculiar as it is in *Monorchotrema taichui* and *Metagonimus yokogawai* and is closely associated with the genital sucker : there are 40-48 conspicuous radiating spines surrounding the ventral sucker but absent from the genital sucker. The eggs closely resemble those of *Metagonimus* and *Heterophyes*. The final hosts are the dog and the cat. Man was easily infected experimentally but the duck proved resistant.

R.T.L.

(c) A small trematode developed in dogs fed experimentally with cysts from the scales, gills and fins of the Mullet. This is named and described as *Monorchotrema yokogawai*. Although the normal hosts are dogs and cats, man can be infected experimentally.

The adult worm measures 0.592 mm. in length and 0.24 mm. in breadth. The single testis is a little larger than in *M. microrchia*. There are 70-74 spines arranged in horseshoe form around the anterior end of the ventral sucker. Text-figures are given illustrating various phases in the development in the cat and the mouse. R.T.L.

(d) Larvæ of *Ascaris lumbricoides* always appear in the urine in heavy experimental infections in rabbits as early as 24 hours after the administration of 200,000 to 300,000 eggs but in light infections, i.e. with less than 100,000 eggs, they seldom appear at all. The number of larvæ present is proportionate to the number of eggs given. R.T.L.

(e) To previously described cercariæ occurring in the mullet Katsuta adds a new species for which the name *Stellantchasmus amplicæcalis* is given on the suggestion of Yokogawa. The adult, which was raised by feeding on dogs and cats and mice, differs from *S. formosanus* in being larger with larger oral sucker and larger œsophagus. The testes are unequal in size. The seminal vesicle is shorter and larger and the eggs are larger. From *S. falcatus* it differs also in various relative measurements and the eggs are smaller. R.T.L.

## 87—Tidsskrift for Planteavl.

*a*. STAPEL, C.—" Om Rodaalen (*Heterodera radicicola* Greeff) og nogle Forsøg til dens Bekæmpelse." XXXVIII (2), 250-272, 5 tables, 1 fig. [1932.]

(a) Stapel describes experiments for the control of *Heterodera radicicola* in greenhouses.

Soil dressings of various quantities of cresylic acid, formaldehyde, carbon bisulphide, corrosi e sublimate, carbolic acid and a number of proprietary remedies were used. The growth of plants in the treated soils, and more especially the amount of gall formation on the roots were compared. Laboratory experiments to check the effects on the nematodes of the various substances used for soil dressings were also carried out.
Cresylic acid and formaldehyde were found to increase growth and fruit production of tomatoes besides exerting a temporary check on gall formation. The latter effect was also produced by applications of carbon bisulphide. Steam disinfection of the soil was the only method by which a lasting effect could be obtained but even by this method the nematodes were not completely eradicated. The other substances proved practically worthless as soil dressings. M.J.T.

## 88—Tierärztliche Rundschau.

*a.* NÖLLER, W.—"Über die Rolle der Wildkaninchen als Lanzettegelträger in einem Thüringer Lanzettegelgebiete." XXXVIII (12), 190-191, 2 refs. [20th March, 1932.]

*b.* LENTZ, W.—"Zur Therapie der Askariasis der Schweine." XXXVIII (12), 202-204. [20th March, 1932.]

*c.* WOLTMANN.—"Neue Beobachtungen über Strongyliden." XXXVIII (19) 323-324. [8th May, 1932.]

(a) Nöller has examined the gall-bladders and livers of 94 wild rabbits and 26 hares in the Thuringia district, where the lancet fluke is common in sheep, and has found 24 of the rabbits to be infected with the fluke. None of the hares were infected.

In some cases where sheep are no longer grazed the rabbits were found to be carrying on the infection. All the areas are on dry chalk hills where the possible intermediate host, *Zebrina detrita*, is known to carry *Cercaria longicaudata* (=*C. vitrina*). The failure of direct feeding experiments on birds and mammals, and the fact that a *Dicrocœlium* sp. has been found in American bats which do not eat snails, have led the author to suggest that a second intermediate host may be involved. For instance, many snails carry fly and beetle larvæ in which the cercaria might become encysted.

B.G.P.

(b) Lentz recommends the use of a new anthelmintic, "Tätivon," for ascariasis in pigs. Made by the chemical firm H. Trommsdorff, the drug contains "Sozojodol," arecolin, potassium arsenyl tartrate and certain flavouring matter, and has the advantage that no purgative is required after its use.

In three tests, involving several pigs each, one tablet of "Tätivon" was given in the morning, to each pig irrespective of weight on the 1st, 2nd, 9th and 10th days respectively. In each case the pig was fasting and had missed the last meal on the previous day. The tablets were pulverized and mixed with food. Evacuation began after 4 hours and there were no ill effects. After the 10th day neither ascarids nor their eggs could be detected.

B.G.P.

(c) Woltmann frequently finds strongyles in the pancreas of horses and assumes that they may migrate from their larval habitat in the arteries to the colon *via* pancreatic arteries and duct. He describes a clean post mortem technique which renders the pancreatic lesions clearly visible.

B.G.P.

## 89—Transactions of the American Microscopical Society.

*a.* HUNTER, G. W. III. & BANGHAM, R. V.—"Studies on fish parasites of Lake Erie. I. New trematodes (Allocreadiidæ)." LI (2), 137-150, 2 pls., 22 refs. [April, 1932.]

*b.* HARWOOD, P. D.—"A note on the tissue-penetrating abilities of sheathed microfilariæ." LI (2), 153-154, 2 figs., 3 refs. [April, 1932.]

(a) Three new trematodes are described by Hunter and Bangham from fish in Lake Erie. *Anallocreadium pearsei* n. sp., from the sheepshead *Aplodinotus grunniens*, is placed in a new subfamily *Anallocreadiinæ* of *Allocreadiidæ* Stossich and the generic description of *Anallocreadium* is emended and now comprises the species *A. armatum* (type) and *A. pearsei*. The genus *Lebouria* is also slightly emended and comprises *L. idonea* (type), *L. obducta*, *L. varia*, *L. alacris* and a new species *L. cooperi* which occurs in the minnows and darters of the Lake. The moon-eye fish *Hiodon tergisus* gave a new species *Crepidostomum hiodontos* closely allied to *C. cornutum* Osborn 1903. R.T.L.

(b) Harwood has studied the migrations of microfilariæ of *Litomosoides sigmodontis*, Chandler 1931, a common parasite of the cotton rat *Sigmodon hispidus* in Houston, Texas.

The adults live free in the pleural cavity and embryos are very numerous in the pleural fluid. In sections of the diaphragm a number of microfilariæ were found outside of any of the contained blood vessels, lying both in connective and muscular tissue but not within the adipose tissue.

R.T.L.

## 90—Transactions of the Royal Society of Tropical Medicine and Hygiene.

*a.* RODHAIN, J. & DUBOIS, A.—" A contribution to the study of intradermal reactions in human filariasis." XXV (5), 377-382, 4 refs. [March, 1932.]

*b.* YENIKOMSHIAN, H. A. & BERBERIAN, D. A.—" A preliminary report on the incidence of hookworm disease in Syria and the Lebanon." XXV (5), 399-406, 1 map, 2 tables, 9 refs. [March, 1932.]

*c.* McKENZIE, A.—" Fatalities following the administration of intravenous tartar emetic." XXV (5), 407-410, 2 tables. [March, 1932.]

*d.* O'CONNOR, F. W. & HULSE, C. R.—" Some pathological changes associated with *Wuchereria* [*Filaria*] *bancrofti* infection." XXV (6), 445-454, 22 figs., 5 refs. [May, 1932.]

*e.* HARLEY, G. W.—" A theory regarding the rôle of insect saliva in filarial periodicity." XXV (6), 487-491, 14 refs. [May, 1932.]

(a) Rodhain and Dubois state that the intradermal reactions to an antigen prepared from *Dirofilaria immitis* are alike in *Onchocerca volvulus*, *Loa loa*, *Filaria perstans* and *Filaria bancrofti* and appear to be a group reaction of the family Filariidæ.

In cases of *Onchocerca* infection with pruriginous conditions the reaction is of greater intensity than in those with no skin changes.

R.T.L.

(b) Yenikomshian and Berberian note an increase in the incidence of *Ancylostoma duodenale* during recent years, especially on the coastal belt, in Syria, with the development of banana, mulberry and orange plantations. Two foci of heavy infestation were discovered; one of 70 per cent. at Rummeili near Sidon, the other of 35 per cent. near Beirût.

Many of the cases were under-nourished and harboured tænia or ascaris as well as hookworms. In the districts of Aleppo, Baalbeck, Hamah, Homs and Damascus the findings were meagre and this is attributed to the severity of the winter, the long dry season and the absence of irrigation.

R.T.L.

(c) McKenzie reports toxic symptoms in eleven cases of urinary bilharziasis during treatment with tartar emetic. Four of the cases proved fatal. The symptoms are attributed to some dissociation of the antimony salt on boiling and the varying degree of toxicity to individual susceptibility.

R.T.L.

(d) O'Connor and Hulse made a detailed study, by serial sections, of a mass of 5 lymphatic glands dissected from an inguinal swelling in a boy of 12. Three of the glands contained 21 filariæ.

The worms were located mostly in afferent lymphatics, or in the capsule or cortical sinuses of the glands. Marked pathological changes (illustrated by 20 microphotographs), such as infiltration and endothelial proliferation, were associated only with dead worms in process of degeneration. The 9 healthy females present contained no filariform embryos, which fact confirms Lane's " cyclical parturition " theory (operation at 2.0 p.m.). Drainings from the wound were negative on blood agar for 9 days, which appears to exclude a bacterial complication. Microfilariæ were still present in the patient's blood after pneumonia with temperatures up to 104.8°.

B.G.P.

(e) Harley suggests that the saliva of the insect host may attract microfilariæ by chemotaxis and may also (possibly by an allergic mechanism) stimulate parturition in the adult filariæ.

The intra-uterine development of ova in filariæ appears (from O'Connor's sections) to be periodically arrested. If the insect saliva stimulates further development and if such development to the microfilarial stage occupies about 12 hours, the periodic parturition of *Wuchereria bancrofti* at mid-day is explained by the insect bites of the previous night. After diffusion of the stimulus the remaining microfilariæ are disposed of like other foreign bodies in blood, e.g., by lymph-glands. The monthly periodicity of lymphangitis (at new moon) in Porto Rico is explained by darker nights, more bites, hyperfilariated mosquitoes, disintegrating larvæ releasing specific protein, allergic response in man. [No experimental evidence is presented.]

B.G.P.

## 91—Veterinary Journal.

*a*. GRAY, H.—" Poultry Pathology and Therapeutics." LXXXVIII (1), 13-15. [January, 1932.]

*b*. CAMERON, T. W. M.—" The internal parasites of sheep: a survey." LXXXVIII (4), 140-148. [April, 1932.]

*c*. HOLLAND, H. M.—" An outbreak of fluke disease in sheep." LXXXVIII (4), 150-151. [April, 1932.]

*d*. REID, H. A.—" Some ailments of sheep in New Zealand." LXXXVIII (4), 157-162. [April, 1932.]

*e*. MILLER, W. C.—" Some observations on Sheep-sick Land." LXXXVIII (4), 167-174. [April, 1932.]
*f*. LE ROUX, P. L.—" Some observations on three communications dealing with the treatment of gastro-intestinal strongylosis of sheep." LXXXVIII (5), 205-207, 5 refs. [May, 1932.]
*g*. CAMPBELL, W. A.—" Fluke in sheep." LXXXVIII (5), 207-209. [May, 1932.]
*h*. HUDSON, R.—" Liver fluke." LXXXVIII (5), 209. [May, 1932.]
*i*. BOWES, H. G.—" A few notes on some common sheep diseases met with in Yorkshire." LXXXVIII (5), 209-214. [May, 1932.]
*j*. GILLARD, C.—" *Cœnurus cerebralis*, or gid, in sheep." LXXXVIII (5), 214-218, 1 pl. [May, 1932.]

(a) Gray has seen gape-worms in young nestling thrushes, birds of paradise, etc., in aviaries.

In young turdidæ, the worm seems to destroy the birds just as they get fairly covered with feathers while in the nest.

T.W.M.C.

(b) Cameron briefly reviews the protozoal and helminthic parasites of sheep, life-histories, methods of control and methods of treatment Only important forms are discussed, and the review is written for the practitioner. T.W.M.C.

(c) Holland records an outbreak of fluke in Yorkshire with a high mortality.

He believes that sheep reared on fluke infested land and treated regularly can thrive; but if moved to unsuitable or richer land, heavy mortality due to a secondary pneumonia may result.

T.W.M.C.

(d) Reid surveys the important ovine diseases in New Zealand.

He finds that country differs little as regards parasitic infections in similar temperate climates. Verminous gastro-enteritis is serious in autumn and winter and can be best controlled by supplementing the ration with oats, lucerne, hay and other dry nutritious feeds. T.W.M.C.

(e) Miller, in an article on sheep-sick land, draws attention to the importance of helminth parasites as one of the causes of this condition.

In a flock of sheep with an average number of worms, he found that 6,000 eggs were daily being deposited (45 eggs per gram of fæces).

T.W.M.C.

(f) Le Roux critically examines three recent papers on the treatment of ovine strongylosis by Seddon and Ross (Australia), Parkin (South Africa), and Wood (England).

He considers that it is desirable to accurately gauge the degree of infestation of experimental animals and prefers artificial infections. He endorses Veglia's findings as to the efficiency of the copper sulphate-sodium arsenite

mixture against Hæmonchus, provided Veglia's method of administration is followed. He finds tabloids, bulky powders, and capsules invariably enter the rumen. 18-24 hours starvation is essential. Carbon tetrachloride is most efficient for hookworms. He does not believe intra-abomasal administration of drugs is practicable. He recalls Veglia's success with enemata against nodular worms. T.W.M.C.

(g) Campbell believes this year's outbreak of fluke in Yorkshire is the worst within living memory.

Fat sheep died within 12 hours of the onset of symptoms. In severe instances, symptoms and death occurred within a month of removal to fluky land. He uses Male fern with good results, alternating with copper sulphate for intestinal strongyles. T.W.M.C.

(h) Hudson records an outbreak of fluke at Retford. T.W.M.C.

(i) Bowes believes that half the sheep losses are traceable to parasites, especially strongyles and fluke.

Parasitic gastritis is the most important disease and he finds animals derive great benefit from dosing with one to three ounces of 1 per cent. copper sulphate in July, August and September. T.W.M.C.

(j) Gillard has written a concise general account of Gid, its symptoms and treatment.

Treatment is surgical and 75 per cent. to 95 per cent. of cases of cerebral gid can be successfully treated. Cerebellar gid is much more difficult. The operation is described in detail. T.W.M.C.

## 92—Veterinary Medicine.

*a.* HARTZELL, H. P.—" Canine Filariasis." XXVII (5), 210-211. [May, 1932.]

(a) Hartzell records a case of filariasis in a dog in Kansas. The case was diagnosed from the microfilaria.

The symptoms were those of anæmia, and weakness of muscular action. Treatment consisted of a meat diet, injections of iron and arsenic intravenously, and exercise. T.W.M.C.

## 93—Veterinary Record.

*a.* DOHERTY, A. G.—" Liver fluke in cattle, a note on medication." XII (16), 444. [16th April, 1932.]
*b.* JARDINE, E. F.—" Carbon tetrachloride as an anthelmintic." XII (16), 444-445. [16th April, 1932.]
*c.* LYNCH, J.—" Carbon tetrachloride as an anthelmintic." XII (22), 609-610 [28th May, 1932.]

(a) Doherty finds camphor, added to the anthlemintic used, assists in the early alleviation of symptoms when cachexia and diarrhœa are pronounced. *Ol. tereb.* added to male fern gave good results. T.W.M.C.

(b) Jardine has used carbon tetrachloride for puppies in the B.W.I., with good results against Ascarids.

An anonymous writer from Kentucky administers Carbon tetrachloride mixed with soda sulphate to horses by means of the stomach tube after 24 hours fasting and finds it gives excellent results against ascarids and strongyles. T.W.M.C.

(c) Lynch considers two drams of carbon tetrachloride is a fair dose for cattle, given in two parts night and morning.

Some animals will tolerate six times the dose. Repeated dosage lessens resistance and purity of the drug is important. It should not be used in acute cases—only with slow progressive cases. T.W.M.C.

## 94—West African Medical Journal.

*a*. LIBERT, C. E. M. J.—"A case of Paragonimiasis." v (3), 51. [January, 1932.]

*b*. TAYLOR, A. W.—"An inquiry into the origin of an outbreak of Schistosomiasis among Europeans at Kagoro, Northern Nigeria." v (4), 61-62, 1 table, 1 ref. [April, 1932.]

(a) The first case of Paragonimiasis in man in Africa is recorded by Libert from Nigeria. The patient was a boy of eleven years of age who first coughed blood when living at Mamfe. During his travels he had been to Bamenda, Bale and Bafut and was in the habit of eating crayfish caught in the river Badi. There were numerous ova in the sputum. The symptoms cleared up with emetine. An examination of crayfish proved negative. R.T.L.

(b) Taylor reports that four or possibly five Europeans became infected with *Schistosoma mansoni* after bathing in a deep pool in the Kogun River two miles west of Kagoro.

The pool is a bare rocky basin devoid of vegetation and containing rapidly flowing water. The source of the infection was looked for elsewhere and was discovered in small ponds fed by streams from which water trickled into the pool and containing the molluscs, *Lymnæa elmeteitensis*, *Planorbis pfeifferi* and *P. stanleki*. Paths from the village follow the river banks and pass between the snail infested ponds. Bifid tailed cercariæ of the Schistosome type occurred in 7 of 210 specimens of Planorbis (mixed) dissected in November-December, 1930. The prevailing type of Bilharzia in the district is *S. mansoni*. R.T.L.

## 95—Zeitschrift für Fleisch- und Milchhygiene.

*a*. KELLER.—"Trichinen beim Fuchs." XLII (7), 137. [January, 1932.]

(a) Keller considers that trichina inspection is necessary in Hessen as he has found a heavy infection in a wild fox. The tongue, diaphragm and masseters were the most heavily infested muscles, and the cysts were round or oval—never lemon-shaped as in the pig. B.G.P.

## 96—Zeitschrift für Veterinärkunde.

*a*. GACKSTATTER.—" Sklerostomeneier im Maultierkot." XLIV (1), 27-30, 5 refs. [January, 1932.]
*b*. GÄRTNER, W.—" Über ' Helmidrast '—ein neues Wurmmittel für Hunde." XLIV (1), 30-33, 1 ref. [January, 1932.]

(a) Gackstatter finds that the dimensions of sclerostome eggs in the fæces of mules cannot be used to differentiate the species, since the various ranges overlap considerably from 55 $\mu$ to 88 $\mu$ for length and 45 $\mu$ to 50 $\mu$ for diameter.

Degree of segmentation is also considered valueless as a criterion since it varies according to the time elapsing between taking rectal samples and examining the eggs (after concentration by flotation in saturated cane-sugar solution) : it may also be affected by varying duration in the host's colon. The eggs of *Cylicostomum tetracanthum* (90 $\mu$ to 100 $\mu$ by 40 $\mu$ to 50 $\mu$) can be differentiated from those of other sclerostomes. B.G.P.

(b) Gärtner has found the best anthelmintic for dogs to be " Helmidrast," manufactured by the Chemische Fabrik Marienfelde and sold in gelatine capsules of 0.6 gm., 1.2 gm., and 2.4 gm. capacity. It is efficacious equally against tapeworms, ascarids and hookworms within 2 hours after a dose of 0.3 gm. per Kgm. of body weight. The drug is harmless at double this dose. B.G.P.

## 97—Zentralblatt für Bakteriologie.

*a*. SCHMIDT, A.—" Beitrag zur biologie der anguillula intestinalis." CXXIV (3/4), 177-180, 17 refs. [March, 1932.]
*b*. SSOLONITZIN, L. A.—" Ueber zwei neue Arten von Nematoden im Vogel." CXXIV (5/6), 361-365, 4 figs., 3 refs. [6th May, 1932.]

(a) Schmidt discusses the biology of *Strongyloides stercoralis* in the light of Leichtenstern's theory that the omission of the free-living sexual generation is associated with a cooler climate.

Six well annotated cases of anguillulosis in Germany, all showing heterogenesis, are shown to have been contracted in tropical climates : in all other cases either there was direct development (15 cases) or development was not observed. The author presents the case of a man who had never left Germany yet the larvæ in the fæces invariably produced the stercoral form, as revealed by cultural methods. (One method due to Fülleborn, using a nutrient agar plate, permits of easy observation and good fixation with formalin). Although this case at first seems counter to Leichtenstern's theory yet the man was a miner working in a mine at Zwickau with a temperature of over 25° C. and under conditions favourable to the tropical (heterogenetic) form of the parasite. B.G.P.

(b) Ssolonitzin describes two new species of nematodes from a collection of worm parasites of birds, derived from the neighbourhood of the Sevan lake in Soviet Armenia.

One is *Rusguniella transcaucasica* n. sp. from beneath the gizzard lining of a gull, *Larus cochinnas*, and the other *Desmidocercella incognita* from the air-sac of 3 cormorants, *Phalacrocorax carbo*. The generic diagnosis of *Desmidocercella* is slightly modified so that this species may be accommodated. B.G.P.

## 98—Zoologischer Anzeiger.

*a*. FUCHS, A. G.—" *Plectonchus dendroctoni* n. sp." XCVIII (1/2), 37-40, 7 figs., 1 ref. [1st March, 1932.]

*b*. RAHM, G.—" Freilebende Nematoden, Rotatorien und Tardigraden aus Südamerika (besonders aus Chile)." XCVIII (3/4), 94-112, 5 figs., 1 pl. [15th March, 1932.], (5/6), 113-128, 42 refs. [10th April, 1932.]

*c*. SCHUMAKOWITSCH, E. E.—" Eine neue Trematode *Maritrema sachalinicum* n. sp. aus einer Möwe (*Larus argentatus*)." XCVIII (5/6), 154-158, 1 fig., 5 refs. [10th April, 1932.]

(a) Fuchs has described and figured a free-living nematode which he regards as a new species, *Plectonchus dendroctoni*, the larvæ of which he discovered under the elytra of a beetle (*Dendroctonus micans*) attacking pine trees, near Villach.

Sexually mature worms developed from the larvæ within four days. The worm is most closely related to *P. coronatus*, with a tendency towards *Panagrolaimus* in the arrangement of the buccal cavity. B.G.P.

(b) Rahm has catalogued the free living nematodes, rotifiers and tardigrades of South America (particularly Chile) in two papers.

The systematic treatment of the nematodes is contained in the first paper together with some ecological notes, but the references are grouped at the end of the second. New nematodes are: *Tripyla bulbifera* n. sp., *T. setifera* var. *triloboides* n. var., *Lycolaimus jheringi* var. *chilensis* n. var., and *Seleneella maipoensis* n.g., n. sp. B.G.P.

(c) Schumakowitsch has described a new heterophyid trematode, *Maritrema sachalinicum* n. sp., from the small intestine of a sea-gull, *Larus argentatus*, collected during a helminthological expedition (under Petrov) to the island of Sachalin. A differential table for the species of *Maritrema* is appended. B.G.P.